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Maj Zelenka.

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REPORT OF COMMITTEE TO INVESTIGATE LAUNCH SCHEDULING STATUS - 19 FEB 1959

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19 February 1959

WS 117L PROGRAM

Report of Committee to Investigate Launch Scheduling Status

1. On 9 February 1959, Colonel Harry Evans, Director for WS 117L, established a committee to visit Lockheed. The committee membership was as follows:

Major Raymond E. Zelenka	Chairman	AFBMD
Major Mark Farnum, Jr.	Member	AFBMC
Mr. John McLachlin	Member	AFPR, LMSD

2. The purpose of the committee was, through objective discussion with members of LMSD, to define exactly what our current position is as it affects the program so that a realistic launching schedule could be determined.

3. The approach taken was to conduct free discussion at LMSD to determine the exact status of the program in the following areas:

a. Manufacturing.
b. Modification and Checkout.
c. Santa Cruz Test Base.
d. Vandenberg Launch Base.
e. Recovery Operations.
f. Tracking Network.

4. The committee had the services of the following Air Force personnel during the discussions held at LMSD on 11 and 12 February 1959:

Major John S. Plummer	AFBMD
Major Norman W. Rehbein	AFBMD
Major Alfred N. Allred	AFBMD
Major John Pietz	AFBMD
Major William C. Bunn	AFBMD Palo Alto Field Office
Mr. Eugene Silberman	AFBMC
Major Ernest H. Brass, Jr.	AFBMC
Colonel Roy Gustafson	AFPR
Mr. G. H. Weaver	AFPR
Mr. Elmo Haden	AFPR
Mr. Francis Smith	AFPR
Mr. Raymond Garcia	AFPR

5. Representing Lockheed Missiles and Space Division were:

Mr. Don Murphy
Mr. Fred O'Green
Mr. Nicholas Milakovich

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Mr. Tram Pritchard
Mr. L. Richter
Mr. Robert J. Naegele
Mr. Ralph King
Mr. Don Smith
Mr. Roy Barnes
Mr. J. Jenkins

6. Facts developed during discussion with LMSD:

A. Manufacturing Area:

(1) There appeared to be unresolved propellant tank problems involving soft areas and leakage. Vehicle 1028 in Mod and Checkout lacked tanks and vehicles 1052 through 1056 also lacked tanks. No ECD's were available from factory C-1 and, therefore, a recovery program could not be established.

(2) Chronic problems involving integrators, computers, horizon scanners, regulators, IRP's, programmers and transducers were all contributing to a behind schedule condition. Some of these problems are resolved in Mod and Checkout.

(3) A task force has been established to attempt, in conjunction with the vendors and test people, to eliminate the shortages. A statement was made that they would succeed within the next four to six weeks.

(4) Normal installation time on a tank in the assembly area is six weeks, but such installation can be made in six days if necessary.

(5) Vehicles 1024 and 1026 have been set aside and 1061 and 1062 are carried on schedule, at the moment, for planning purposes. Vehicles 1024 and 1026 are held at the moment as possible replacements for 1061 and 1062.

(6) LMSD will provide AFBMD, by 25 February 1959, results of a cost analysis study on recycling 1019, 1024, 1026 to a UDMH configuration as opposed to the cost of completing 1056, 1053, and 1055.

(7) LMSD requires instruction or guidance as to which payloads are sacrificed in the cutback to fifteen flights and an identification of where they fall out of the schedule.

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B. Modification and Checkout Area:

(1) The guidance computer and associated integrator are pacing items through Mod and Checkout.

(2) Sixty days are required in Mod and Checkout from receipt of the computer to release of the vehicle from Mod and Checkout.

(3) Ninety days are required from receipt of the vehicle from final assembly to release from Mod and Checkout, with an interval of approximately two weeks between release of vehicles.

(4) Vehicle 1020 is minus the SS/L payload. This does not appear to pose a serious problem as the payload can be mated at Santa Cruz.

(5) Mod and Checkout is still experiencing troubles with component items, as for example the guidance gyros. The schedules established in Mod and Checkout do not provide for unforeseen trouble areas. Any such areas arising will certainly affect the schedule.

(6) 80% of the time in Mod and Checkout is spent in repair of components and 20% in test.

(7) The lack of LACE has had no delaying effect in Mod and Checkout.

(8) There are five Mod and Checkout positions in active work at the moment and these are two system checkout positions, two guidance checkout positions and miscellaneous subsystem checkout and rework stations. Mod and Checkout can process two at a time through all the hard areas.

C. Santa Cruz Test Base Area:

(1) No attempt is being made at Santa Cruz to simulate flight conditions to be encountered with the vehicles. Facilities do not provide adequate means for duplicating the functions that would occur during countdown.

(2) The entire Santa Cruz and Vandenberg schedules will require an approximately 48 hour work week for all personnel. In the event any difficulties are encountered, additional overtime will be necessary.

(3) The purpose of the tests at Santa Cruz are essentially an engine performance test during which installed subsystems and critical points within the vehicle are monitored under vibration.

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(4) In the event the tests at Santa Cruz are bypassed with any flight vehicle, the work to be accomplished at Vandenberg on that particular vehicle will not increase. There is no modification work on flight vehicles being accomplished at Santa Cruz. There are very minor modifications being accomplished at Vandenberg.

(5) The schedule for flight vehicles at Santa Cruz requires full time occupancy of the two available vehicle test stands. Present scheduling does not provide any allowance for propulsion test vehicle tests or R&D testing other than scheduled flight vehicles. As a very minimum, tests at Santa Cruz will require a three week occupancy of the test stand by the specific vehicle being tested. There will be a requirement at Santa Cruz for GSE testing for which the present schedule does not provide test stand availability. The present contract includes a captive test vehicle in the Sentry configuration. Present plans at Santa Cruz do not provide allotment of test stand time for tests with this vehicle.

(6) Unless the AF Acceptance Team relaxes some of their test and data requirements, the three week schedule at Santa Cruz is considered impossible even with the use of unlimited overtime. Two vehicles can be worked on simultaneously at Santa Cruz with the present test stand-block house arrangement. Until the accomplishment of a change in the instrumentation of the block house, which allows quicker patch jobs between vehicles, there will be a minimum of four to five days between test stand firings. The effectivity for this change, which will allow test stand firings two days apart, is approximately five months away.

(7) To accomplish the proposed change in the propulsion system which incorporates dual burning provisions will require propulsion test vehicle testing at Santa Cruz under present plans.

(8) The Acceptance Team has imposed testing requirements in addition to those originally anticipated by Lockheed in programming the Santa Cruz operation. While Lockheed readily admits the desirability of these tests, there are certain areas which must be resolved if a three week schedule at Santa Cruz is to be attained. Lockheed apparently suggests a compromise whereby results of tests in Mod and Checkout are accepted in lieu of the Santa Cruz testing. Lockheed suggested the possibility of eliminating vehicle tests at Santa Cruz as soon as three successful UDMH vehicle firings are realized and to schedule subsequent testing on a sampling basis. Lockheed stated that to accomplish UDMH engine and dual burning tests appropriately, it would be necessary to accomplish these tests at least in part at Santa Cruz with PTVA's.

(9) In the schedule for Santa Cruz the vehicle will be installed in the test stand the day after it arrives and will remain in

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the test stand until the day before it leaves. There will be a flight vehicle in each test stand (2) at all times to meet schedule requirements.

D. Launch Base Area:

(1) Best estimate of time required for pad cleanup and conversion to accommodate vehicle configuration differences between flights with vehicles 1022 and 1018 is approximately 800 manhours or 22 days.

(2) Lockheed stated that to the best of their knowledge all spare parts and equipments needed to repair the launch pad between flights two and three are presently available at Vandenberg.

(3) Lockheed has not incorporated any design changes into the GSE or launch complex equipment to minimize pad damage or delay between launches as a result of information gained from experience with the Thor launches at Patrick or the demonstration flight at Vandenberg.

(4) The activation of Pad 5 at Vandenberg is essentially proceeding to readiness date of 4-30-59. Some equipment is a little bit ahead of the schedule and some behind. There is no joint Douglas-Lockheed pad activation schedule which integrates detailed actions of both contractors to meet a 30 April readiness date.

(5) The present plans at Lockheed are for a first flight in mid-May from Pad 5. This information was previously given to AFBMD by the XA Project.

(6) A minimum time between firings due to personnel and equipment interchange problems was stated to be one week; however, two weeks is believed a more realistic period.

(7) Recruiting is now being done to obtain additional people to man the Pad 5 operation. Technicians are being screened at Sunnyvale and Van Nuys for possible use on a temporary basis. It is forecasted that unlimited overtime authorization will be required at Vandenberg to get the two pads in operation. Problems have been encountered in scheduling manpower to perform specific jobs due to the two-contractor concurrent operation in areas where only one crew can efficiently work and in many instances where the commencement of work of one crew is contingent upon the accomplishment of the previous crew's work. This has caused a need for many hours of overtime and also many hours of idle time. Generally the work of Lockheed and Douglas crews has been accomplished with a minimum of friction between personnel.

(8) The schedules outlined at Vandenberg are predicated on a six day week, considerable overtime and a limited second shift operation.

(9) The entire Santa Cruz and Vandenberg schedules will require an approximately 48 hour work week for all personnel. In the event any difficulties are encountered, additional overtime will be necessary.

(10) There will be two complete sets of subsystem checkout equipments at Vandenberg similar to those equipments utilized in the Mod and Checkout area. They also have a complete systems checkout console at Vandenberg.

(11) In the event the tests at Santa Cruz are bypassed with any flight vehicle, the work to be accomplished at Vandenberg on that particular vehicle will not increase. There is no modification work on flight vehicles being accomplished at Santa Cruz. There are very minor modifications being accomplished at Vandenberg.

(12) The period between receipt and launch of vehicles at Vandenberg is an absolute minimum of six weeks. The interval between flights from any one pad is between four and five weeks. The AFBMD flight test working group at Vandenberg has estimated a minimum of 21 days from the time both vehicle and booster are mounted on the launch pad to actual launch.

(13) The original estimate of time required between receipt and launch of vehicles at Vandenberg was eight weeks, which has been cut to six weeks on the basis of the use of unlimited overtime. The cleanup of the launch pad and the checkout of the vehicle and booster on the pad can be done in part concurrently so that all work can be accomplished in a period of approximately five weeks. The time of three weeks on the pad and five weeks between launches is not cumulative.

(14) Lockheed does not concur in the requirement that detailed test objectives be furnished 75 days in advance of the vehicle launching to which they pertain. Lockheed further suggested that requirements of the flight test working group can be satisfied with regard to detailed test objectives with information concerning launch trajectory and range safety prior to actual completion of the detailed test objectives.

E. Recovery Operations Area:

(1) The recovery force, composed of C-119 aircraft stationed in Hawaii and C-121 aircraft dispatched from McClellan AFB in advance of the flight, are now in a state of readiness and will accommodate the scheduled recovery launches. The communications system is considered satisfactory.

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F. Tracking Network Area:

(1) Tracking and Acquisition Stations are now complete, equipments installed and checked out with the exception of one major item, which is the Acquisition Programmer. There are other relatively minor items missing, such as Delineators. This equipment is not vital to flight operation although it is important. Flight missions can be accomplished with equipment now available and installed in the T&A Stations. No difficulties are anticipated for handling flights between now and June with respect to T&A Stations. The operation of the T&A Stations does not require any specific period of time between launches of vehicles. In the event equipment breaks down or experience dictates equipment modifications, the T&A Station complex allows for the shutdown of individual stations while still accomplishing specific missions since stations are strategically located to provide overlap flexibility.

7. Conclusions:

a. The following assumptions were made and bear on the conclusions:

(1) Mod and Checkout Area:

(a) Minimum of 13 days between acceptances.

(b) Input from final assembly will continue "on schedule" with a gradual "beat-back" of modification and out-of-station installation of late equipment.

(c) No major changes required due to flight experiences.

(d) Improvement in the timely receipt of critical parts and equipments.

(e) An orderly relocation to the Sentry building.

(f) No restriction on use of overtime as required.

(2) Santa Cruz Test Base Area:

(a) Continuous weather within "acceptable limits."

(b) Minimum of seven days between acceptances.

(c) No interference by test vehicles or GSE.

(d) No unusual difficulties encountered during tests and acceptances.

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(e) No restrictions on use of overtime as required.

(f) Maximum span within the area of four weeks until the sixth article.

(g) Every flight vehicle requires test at Santa Cruz.

(3) Launch Base Area:

(a) Complete availability of Pad 5 on or before 15 May 1959.

(b) Minimum of 4-5 weeks between firings utilizing one pad.

(c) Minimum of 14 days between firings utilizing two pads.

(d) No significant slippage of input.

(e) No significant "changes" to vehicles or GSE.

(f) Timely receipt of spare parts.

(g) No delays due to:

1. Weather
2. Tracking equipment failure
3. Late arrival of booster
4. Booster or GSE problems

(4) Recovery Operations Area:

(a) No significant technical problems can be cited which would bear upon the realism of schedules.

(b) No major design changes in equipments will be required as a result of actual test operations.

(5) Tracking Network Area:

(a) No significant technical problems can be cited which would bear upon the realism of schedules.

(b) No major design changes in equipment will be required as a result of actual test operations.

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b. The conclusions stated generally are as follows:

(1) Significant problems do exist in Areas A, B, C and D which are affecting the schedule.

(2) There is little if any room in the schedule for major problems which may arise in any of the areas A through F.

(3) No provision made for scheduling Midas vehicles through the various areas through CY-59.

(4) No provisions are made for vehicle, GSE or propulsion testing at Santa Cruz other than tests on actual flight vehicles.

(5) The details of the analysis made on the realism of schedules is contained in the attached chart.

(6) It is to be noted that those flights scheduled near the end of a month are subject to slip to the succeeding month, thus additionally perturbing the projected schedule.

(7) No attempt is made within the charge to this committee to recommend solutions to the problems which are quite evident in the content of this report.

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WS 117L Sked

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Major, USAF
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Prod. #

Flight Vehicle	Out of Final Assembly	Mod & Checkout In	Mod & Checkout Out	[redacted]	AFBMD Forecast	Santa Cruz Out	Santa Cruz AFBMD Forecast	Santa Cruz Best LMSD	Flight Date	Flight Date AFBMD Forecast	Flight Date Best LMSD
1019			9-19 (9-25)			10-30 (10-21)			1-21 (12-6)		
1022			11-4 (10-31)			11-25 (11-29)			2-25 (1-15)		
1018		11-6 (10-31)	1-18 (12-17)			2-18 (1-11)	2-20		3-19 (2-23)	4-15 4-13	4-1
1020		11-25 (11-18)	2-13 (1-15)	Computer Delivery		3-9 (2-8)	3-21	3-11	4-15 (3-23)	5-16 6-21	5-2
1023		12-6 (12-3)	3-6 (2-2)	1-14	3-15	3-30 (2-28)	4-15	4-8 4-18	5-20 (4-15)	6-9 6-15	5-26
1029		12-29 (12-17)	3-19 (2-13)	2-13	4-14	4-10 (3-11)	5-11	5-4 5-1	5-27 (4-25)	7-6 6-30	6-22
1025		1-16 (1-5)	4-3 (3-2)	2-18	4-27	4-27 (3-28)	5-26	5-19 5-15	6-18 (5-15)	7-19 ?	7-4
1026	No tank	1-29 (1-19)	4-17 (3-16)	2-23	5-10	5-11 (4-11)	6-11	~~[illegible]~~ 5-28	6-25 (6-15)	8-6	7-23
1051	2-12 (2-2)	2-13 (2-2)	5-2 (3-30)		5-23	5-22 (4-25)	~~6-26~~	6-29 6-8	7-16 (6-25)	8-29	8-15
1050	2-25 (2-16)	(2-16)	5-15 (4-13)		6-6	6-5 (5-9)	7-11	7-4	7-24 (7-15)	9-6	8-22
1052	3-2 No (3-2) Tanks	(3-2)	5-28 (4-27)		6-19	6-18 (5-23)	7-23	7-16	8-12 (7-25)	9-28	9-14
1054	(3-16)	(3-16)	6-10 (5-11)		7-2	(6-7)	8-11	8-4	8-25 (8-15)	10-12	9-28
1055	(3-30) ↓	(3-30)	6-22 (5-25)		7-15	(6-21)	8-23	8-16	9-9 (8-25)	10-28	10-14

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Flight Vehicle	Out of Final Assembly	Mod & Checkout In	Mod & Checkout Out		[redacted] AFBMD Forecast	Santa Cruz Out	Santa Cruz AFBMD Forecast	Santa Cruz Best LMSD	Flight Date	Flight Date AFBMD Forecast	Flight Date Best LMSD
1033	(4-27) ↓	(4-27)	7-7 (6-23)		7-23	(7-20)	9-11	9-4	9-22 (9-15)	11-12	10-28
1036	(5-11)	(5-11)	7-30 (7-8)		8-6	(8-3)	9-23	9-16	10-9 (9-25)	11-28	11-14

( ) Contractor's November scheduling to meet contract requirements.

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As of 16 Feb 59

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LMSD 423100

NOT LOGGED

February 10, 1959

Well, I would like to define our purpose. Colonel Evans established a small committee, composed of myself, Major Farnum of AMC and Mr. McLaughlin. What we-would like to do in the next few days is to attempt to define exactly what our current position is affecting the program, so that we can properly determine a realistic ~~shift~~ schedule and, hopefully, by some factual and objective discussion of the problem areas concerned, ~~and~~ know the exact status of the following areas: Productinn, Mod and Checkout, Santa Cruz, or the recovery activity, the tracking network, and also launch base problems. The material presented and discussions held, hopefully, will assist us in defining just what steps are necessary contractually to reflect the proper reorientation.

Now, we are on recording, so it will not be necessary to take notes. People who are not on the committee, but attending, feel free to ask questions of the speaker at any time; identify yourself so that the recording can be transcribed.

As John said, we will start with Production and then go along to Mod and Checkout problem area.

You are not scheduled in Santa Cruz today?

I didn't think we could make it, but we can do this. We are standing by ready.

Okay. We will go as far as we can today and it may be possible to get the Santa Cruz Test Base thoroughly covered and we have scheduled tomorrow a discussion of the recovery area, the tracking station network,

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and the problems in the launch base as they affect our current position. In other words, we can start out with the individual concerned with the Production status. Are we getting through?

Yes.

Name, Nick Malocovich. We present the production status. We have presented the production status up to where we transpose it to the Mod Center. The next bird over and its vehicle will be 1051, and it's approximately eight days behind schedule, and we have the rest of the Thor vehicles in process, through 1058. We are generally on schedule in Van Nuys on the Van Nuys assemblage, and it appears that we will under-run the hours down there something like 3200, at least I hope 3200 hours through 58 on the budget at Van Nuys. On the vehicles in process at Sunnyvale, Thor vehicles, again, we are approximately 4300 hours behind schedule, mostly because of the propellant tank problems. Some of you know that we had problems and needed analysis of things -- we had some soft areas. This thing was resolved, and I just got through talking to Mr. O'Green this afternoon and he says this is back in the picture again, but in addition to this, we had a leakage problem which/we have unresolved at this time, and I am unable to get any ECD's out of factory C-1 so that we can firm up a recovery program.

In addition to this tank problem, we have had, and still have some chronic -- ten major items like the integrator, computers, horizon scanners, regulators, IRP's, programmers, transducers that have been plaguing us constantly and we have been unable to complete this work schedule, and consequently we are behind schedule. We just have established a task force to make a real attempt with the vendors serving the project and the different test people involved to eliminate these shortages, and I think that we will in the next four to six weeks.

I have some charts here, typical charts of a bird or a vehicle, 1051 or 52, and I have 1053, if you want to see it, depicting the status. This bird -- the next one -- will be carted after bird 1051, and again, it's only held up by the lateness of the tanks. 1052 does not have a tank.

To summarize it, we are in pretty fair shape on tanks in production. Here's the picture of the schedule position. Start with Van Nuys -- I put on it "ahead of schedule," and "below schedule," and we are under-running a little bit, as I mentioned before. In the Bay area here in our assemblies, we have got this deficiency to make up, and if we had the tanks, some of the shortages, we could close this gap and bring back our input. Any questions?

Q Yes, this is Major Farnum. Did you say that you are essentially on schedule? How much flow time to you allow from delivery to final assembly to launch? In other words, what is the basis for your schedule?

A Well, our schedule -- you mean --

Q How far back do you go from launch to final assembly?

A I don't know that. You've got ten weeks in Mod and Checkout -- eight weeks in Mod and Checkout -- eighteen weeks.

Q These discrepancies that you have, the shortages, which of those would you consider pacing items? Some of these you can go on a station with? For instance, the horizon scanner, I imagine you could do -- could deliver this short to Mod and Checkout and install it there, but others, such as the tank, I imagine this holds up your assembly at that point, and then from that time, you have to wait for the tank, and this is time that can't be made up later.

A Yes, that's right. The tank would be that type of item. However, we have installed tanks in Mod and Checkout, but it jeopardizes schedule or causes some slippage there.

Q What are the pacing items that you have in assembling -- the items that you describe as short?

A I would say that the tank was the most critical. In other words, if we get the tanks, we can essentially complete the vehicle, and these other items, it is a matter of hours to install.

Q Do I understand that your schedule of final assembly is contingent upon availability of tanks?

A That's correct.

Q How does the schedule of tanks compare with your schedule?

A Like I said before, we don't have any schedule at this particular time, availability of tanks. We are short four tanks in final assembly and we are short one tank in Mod and Checkout, vehicle 1028. We have two tanks in rework at C-1 and will return this other one for rework and there are six new tanks in process at C-1, so there's 10 tanks in process.

Q Well, is this right, then, that we can't really determine what your schedule is on final assembly until we know the schedule of tanks?

A Until we resolve this tank problem which can be resolved momentarily, that is correct.

Q Would you go down through a schedule of where we stand today -- vehicles, tanks, assembly, and what we should get out of final assembly -- a forecast of tank recovery.

Q This is Major ~~G~~______. Could I ask you to incorporate in that answer, as you go down vehicle by vehicle, your estimate of its current position, and how far you are from delivery to Mod and Checkout on the schedule?

A I didn't understand the question. We have tanks on 1051 and 1050, the next two vehicles, and if we get tanks within the next week, it is conceivable that there will be no additional slippage on the vehicle recovered.

Q You have a tank in Mod and Checkout, you say?

A Yes, 1028.

Q Can you take it vehicle by vehicle and give us their position at the moment with respect to what your schedule is to be at Mod and Checkout? For example, 1050, how far are you from delivery to Mod and Checkout?

A Well, 1051 was delivered to Mod and Checkout Friday, eight days behind schedule.

Q Can you review for us each of the items?

A 1050, 1051, 1051, 1050, 1052 and up?

Q Yes. 1028?

A 1028 is in Mod and Checkout now. (Aside conversation that was not clear enough to transcribe). This has a tank in here -- or has a tank -- we don't know if it's . . . now I don't know when we are going to get tank from C-1. They haven't been able to tell me. I called them.

Q Well, what is the scheduled delivery date on each of these vehicles to Mod and Checkout? Presuming you would be on schedule, when would you make delivery?

A When I should have made delivery? I should have delivered 1051 eight days ago. 1051 was originally scheduled 2/2; 2/16 on 1050; 3/2 on 1052; 3/16 on 1054; 3/30 on 1055; 4/27 on 1053; on 1056, 5/7; 1057, 5/25; 1058, 6/9; 1061, 6/23; 1062, 7/22; and we should cart this this Friday which will be -- this one should go a week from Wednesday; this one should go a week from Wednesday.

Q Would you identify, when you speak, the vehicle under the date you put down?

A 1051, we will transfer from Production to Mod and Checkout the 13th. 1050, we will transfer the 18th, a week from Wednesday.

Q A week from this Wednesday, or next Wednesday?

A A week from next Wednesday.

Q The 25th.

A On the balance of the vehicles, it is impossible to determine the actual date because I can't -- I am unable at this time to get availability on the tanks.

Q Major Farnum again. Just to make the picture complete, can you run another column there to indicate which Flight Vehicle these are?

A 1051 is 9; 50 is 10; 52, 11; 54, 12; 55, 13; 53 is 14; 56 is 15; 57 is 16; 58 is 17; 61 is 18; 62, 19.

Q This is Major Farnum again. What is your full time from the time you install the tank until you deliver it to final assembly?

A Well, normally, six weeks, but we can install a tank and have everything done - to final - in six to eight days. Actually, we can install a tank in as quick as three days.

Q You can do all the other work, you can index the mate, and so forth, without a tank?

A Yes.

Q So if we had tanks it would be possible to recover the schedule in about a matter of about four weeks. It isn't the fact that you lose -- every day you are behind in the tank schedule, you are behind in the vehicle?

A No. We do all the other work, the pre-mating, the soldering of wires; we do a lot of work -- some of them you have to redo, yes, sir.

Q This is Don Murphy. I guess what you are saying is that if you don't get tanks at least six days before it's due out of final, then you have to slip schedule?

A Yes, that's right.

Q If you get the tank six days before it's due out of final, then you can meet schedule?

A Yes, but then if I don't make that schedule, also, Don, I can get my people back on subsequent birds and if I get three tanks at one time, I can take it up in a hurry.

Q But you don't figure you have a critical problem yet, schedule-wise?

A Well, I consider it critical, and I also consider it critical to the degree that if we don't get tanks within the next two weeks, we will have to lay off about forty people, or move them off somewhere.

Q This is Major Z______. I would assume, then, that you have already made eight deliveries to Mod and Checkout.

A The first eight flight vehicles have been delivered to Mod and Checkout, yes, sir.

Q This is Major Farnum. What is the status of 1024 and 1026?

A They are in Mod and Checkout, but . . . and the Navy have that status report.

Q I should think this would tie in with the manufacturing end of it. If they are going to rework these, they should have been 1061 and 1062, should they not?

A They are.

Q Well, haven't you started 1061 and 1062 into assembly in the component parts, fabrication?

61 and 62 are for planning purposes on our schedule.

A That's right.

Q There has been no component parts on 1061 and 1062?

A There should be. The numbers are released only for planning purposes.

Q How does this fit into your flow time on this schedule? It says that you should have released these on the 13th of October.

A Are 1061 and 1062, identified as 1061 and 62, or are they identified as .26?

Q No, the point I want to make here is that 24 and 26 no longer appear on our schedule as numbers.

A No, but to meet schedule, the way I read that thing, you have to make the release of 13 October for 18 and 19 to meet the flight dates, but your ________ time being such that to fly these things in October and November, it required this release.

Q All right, I am not going to argue about it, but I don't understand the point.

Q My question is, once and for all, I would just like k to find out what the status of these two birds is, whether any components have been released and are being fabricated, or haven't been?

This is Tram Pritchard. Our schedule would call for releases in January.

Q Is that the new schedule? Oh, I beg your pardon. This was when it was scheduled previously. Assuming that these were birds that started to be scratched, you are right, Mark. Now, I want to be fair, too, but I have repeatedly said, and you have repeatedly told me that these are for planning purposes and have no relation against the status of ______. But there were releasing against them, Mark, 21 and 22 . . .

A 1061 and 1062 haven't been released, and this is contingent upon the disposition of 24 and 26. This is in Mod and Checkout. This is a plan as a replacement for 24 and 26.

We have established for the record that there would be no termination against those. If there was termination, it would be against 1024 and 1026.

Are you satisfied, now?

Well, I wasn't looking for any particular answer. I would just like to know what the status was. Also, for 1019. If you feel that you can recycle 1061 and 1062, could you not also recycle 1019?

A Well, this is a point I guess we have yet to determine, Mark. Since these three we are talking about, 19, 24 and 26 are JP-4 engines and there is some pad rework involved in GSE because of the conversion to MH. It's a question of whether it's practical to convert back for JP-4 flights. JP-4 flights will not serve our objectives from a flight standpoint, is this right, Fred?

A That's correct.

-- downstream,they won't.In other words, they couldn't be substituded for a downstream ____ flight from a practical standpoint.

Q Well, with this new program, and the possible cancellation of four vehicles, you are going to have to make a determination whether to recycle these three birds as the 12th, 13th, 14th and 15th, or to scrap them, is that right?

A Ri Right.

Q If we pass those three, 13, 14 and 15, what is the status of the report of manufacture on those? Fourteen, Fifteen and sixteen.

Q Can you tell us now, then, the status of those, 14, 15 and 16?

A No.

This is Murphy. I guess it's only a matter of getting to it, Mark. Do you have feel, Nick, or Bill, for how long it might take to draw up this information? What we are looking for here is a set of statistics, what's the cost of completing the vehicle and the associate cost of reworking the pad back to JP-4, and other changes, or conversely converting it to UDMH, against the cost, also, of completing 14, 15, and 16.

If you don't make this decision soon, we will have made it by default. The other birds will have been built. Time's running out.

Today's what, Wednesday? We will have it in for you by next Wednesday at the latest. We will look at the comparison cost, completing them as they are, converting them to UDMH, as well as the cost to complete 14, 15 and 16.

Fred?

Q The question that will have to be answered in making that determination is whether or not we are going to ________ these flight objectives against the program which is reoriented, in which we do not fly the last four birds, and if they are going to meet the flight objectives of the program of the first fifteen, we are going to have to know what the payloads are going to be, and I think we can almost be guaranteed right now that they will have to be UDMH flights or we can't do it.

A I guess what you are saying is that in the nineteen flight program versus the fifteen, four payloads, or four flights, drop out?

That's right, and I think we can be assured now that the payload weight that we are talking about in our program, are such that we couldn't entertain the use of JP-4.

Well, I think that this is probably the net result of study, but I personally believe that we are obligated to come up with a figure on all three ways.

Are you saying that this should be the last three birds of a fifteen bird program, then? Also as one of the considerations?

Yes.

That would effect where we stand on the schedule. If by Wednesday, we could have a determination as to what four payloads, or what four flights drop out, it would help us to see whether or not there are some objectives that are later downstream, or these three converted birds, for example, converted birds that meet the objectives required.

This is Haig; Has the Air Force declined , or is it necessary that the Air Force decline what four flights will be eliminated --

Yes.

-- or understood that they will be the last four?

Well, we have to be told either that they are the last four or they're some other four.

This is Major Z_______. I think what you really want to know is which payloads are sacrificed in the cutback to fifteen flights.

That's right.

Also, you want to know where they fall out of the schedule?

We have some moreiinstrumentation checkout equipment in process down in Van Nuys that should be appearing right around the first of March.

Major Zelenka: You are tying in the stand looks like three to three and a half months. Is there any action that should be taken to assure that that time ? stand

A: Yes, there is one very good action which would be to get the parts of the vehicle available to start with. I would like to point out that 1018, in spite of what I said, went out 41 days after I got my hands on the computer. That was a pretty buggy trip.

Well, recognizing that as a fact, that you would normally have [illegible] these shortages, is there anything that can be done to shorten the time that you have these things in mod and checkout?

If I knew of anything, it would have been done, believe me.

Well, I think the answer to Maj. Zelenka's question, we are looking at one of seven-day weeks, and third shifts, and things like that, past the time scale, once we have solved the equipment availability problem.

What type shift are you on now?

Two shifts in guidance and instrumentation.

This is . Could you indicate on there from 1020 and down when the guidance computer is available, or are you forecasting that?

I'd have to go back to the records to do that for you accurately.

Let me ask you this question. You consider the guidance computer a pacing ? item through mod and checkout?

At the moment, yes.

Tram, do you have some figures on when you figure the computer was delivered?

The computer for 1020 was delivered on 12-17.

There were some changes, and we weren't up through 1-24.

For 1023, the computer was delivered on 1-14, 1-28 was the rework completion.

You are correct, for the Major rework, and it's never quite done.

The computer for 1029 is promised for 2-13. For 1025, on 2-18. For 1028, 2-23.

This is complete, is that clear?

That's as complete as anything.

You'll notice here the fact that we can't quite swallow a five-day interval.

This is fine with me.

Do you know that this schedule of dates could be better? Is there any possibility of bettering that schedule?

In this particular phase of the business, these are neither pessimistic nor optimistic. I would be going overboard to say that everything is going to come out [illegible]right. I have not put in a contingency for trouble, . There are between what you would like to have and what we have experienced from practice. These represent a reduction in time on 1025, hours spent on the job of about 20% from 1018.

This is Maj. Zelenka. Will 1020 go out on 2-13?

It will provided that we do not have a major failure between now and then.

You had one question, however, that I should bring up; the SS/L package is not complete, and I can say that 1020 will be on 2-13, the same 1020 minus payload.

I don't quite understand if it's minus payload and then over to Santa Cruz, or do you hold until the payload problems are resolved?

This is a question that has to be resolved. Actually, the intermission between the vehicle and the "L" payloads is very tiny, and it does not create a technical problem to do this. There is really no technical reason that they have to accompany each other.

Is Santa Cruz still set up that they could take over the mating?

If we transferred in that manner, we would go and do the mating.

You'd do that yourself?

That's right.

Murphy: XXX Burke and the boys tell me that these dates are not the same ones that came out of the meeting thismorning.

They aren't dates, they wrote them on my clean white blotter ???

Tram, what's your reading on this? Are these the dates that came out of the meeting this morning?

I wasn't in this morning.

Gray--This is hot the schedule as he showed me.

I was in a meeting with XXX Rick, and these are not the dates that he and I discussed.

These dates here--they are, that I have right in front of me on my paper. 3-30, 4-20, 5-11.

Wewere ~~talk~~ talking about beating that and meeting the ones on my yellow piece of paper.

We were discussing whether we could or not.

You're correct.

What are the dates on your yellow piece of paper?

2-13, 3-6, 3-19, 4-3, 4-17. That last date provides the full span for mod and c/o work with a promised completed computer.

Murphy: For the record, let me review these dates. 1023 forecasting for 3-6 rather than 3-10; 1029 on 3-19 as opposed to 3-30; 1025 on 4-3 rather than on 4-20; 1028 on 4-17 rather than 5-11. I think this sort of answers your other question, Mark, the new dates that we have quoted here are probably the absolute maximum that we could do.

Well, that would seem to indicate that after the delivery of this guidance computer, that it would shorten it from 60 days to 30 days, in the case of 1029, at least.

This is one of the points of difference in your estimates, Don.

Well, there is a difference of opinion. May be we should consider both ends of the spectrum here.

Well, I think this is right Ray. You see, what we are gambling here, we are trying real seriously to hold the flight schedule through June.

In order to do that we need , and meeting these dates would require a full span at Santa Cruz and VAFB, is this right?

It would cut one week off at Santa Cruz, and/hold the full span at VAFB.

There are some soft spots here, but I don't mean to say that we feel good about these dates.

in the same kind of things Rick has mentioned here, if we are fortunate and get enough of the bugs worked out of the computer and the ~~syncopater~~ integrater (G) and some of the other areas that are causing us headaches, then the learning curve may pick up here pretty fast and it may not be so impossible to going onto a third shift basis does help. The thirty-day span here is not necessarily indicative of the man-hours that it will take to get the thing out.

Zelenka: Again, trying to be realistic about this, what is O'Green's feel for what progress can be made in the time interval on this guidance equipment?

O'Green: The problems that we have with our guidance system I think can certainly be improved. I do not have first-hand information (could not understand).

I'm surprised that it should be a thing that could cause us so much difficulty right now. I did have one comment from yesterday,

It is a problem of getting our guidance gyros to come up to performance so that each one coming in is difficult and started to fix it a couple of times. We've been working with Reeves on this, you know, and we are also working

(this portion is unintelligible—)

and we have kicked these shots over completely in order to get the quality control up where it belongs, and special lines established, and everything, and we thought we had them both licked, and they were delivered, and it was only about three weeks ago that we thought we got ourselves out of trouble. I'm sure that we can improve this area, I think also however, that we can hold that date on 1028, from the estimated 5-11 to 4-17 is possible for us and is as good as you can get. It is several weeks improvement over our present performance, and we are working towards that and I think we will have a better view of the problem in a week or so.

Well, even with these new estimates on dates, you're still not going to meet the main schedule of firing. 1029 is the first one, 1025 should be the second one, fired in May.

With these new dates, we would — There's something wrong— Pardon me, I'm wrong, 23 and 29

Farnum: We realize there is no guarantee in this R&D program of meeting schedules. Do you in mod and c/o feel that you would meet these advanced dates over those that you put up?

Kearton: These dates aren't essentially, at the moment, the type of thing that would happen to you if you went through without a major failure. Actually, 80% of the time that we spend is repair. About 20% of it is test. These are the type of thing that you get if the IRP didn't cut/~~choo~~ up, if the computer didn't have to be changed, if the actuators didn't switch, and if the flight control package worked. This type of thing begins to walk up. It is a poor thing, in my opinion to fool anybody with, though, because this could happen. It could happen in here, but it's not a thing that you can predict.

Is your experience ever been such that you do have this kind of luck at this stage of development?

We could have. We've only had one major inferior flight control package since 1019. Unfortunately, this occurred yesterday, so it doesn't say that we are over the hump, but there are many parts of the bird that are leveling out, and our real problem is in the fact that the major difficulty is in the long serial time items.

Fallon: To be realistic, How much do we really know about this bird without having fired it?

Kearton: Actually, the testing that we are having to do since we have not fired a bird, and don't have firing experience on it, is quite extensive, and we are including everything that by any of our thoughts is necessary to insure that they will work. I don't thinkthat I could really directly ~~xxxxx~~ answer your question, but I/have a ~~can~~ reasonably degree of confidence, in fact, quite a high one, that these things as they go out are ready to fire.

O'Green: I think maybe I would like to comment on that also. We have actually proved a great number of hours of environmental testing that has been performed. We have fewer number of hours of testing of the overall circuit. However, we have attempted to work into all of our c/o procedures experience with regard to the system by time and countdown failure, where the people in mod and c/o start over. They don't start at the place where the failure occurred--they go back to the beginning. So there is a lot of running time on these parts and we are learning a great deal about them. We can expect to have problems come up, miscalculations, and so forth, we really expect to have problems of reliability, in areas which we don't know about today; also in places where loading of the problems of actual performance and maintanance in regard to efficiency. This would be the first program that ever came up without any of these difficulties, if we don't have some.

Farnum: Aren't we sort of realistic if we don't factor in some sort of contingency -- could we schedule this thing on strictly a production basis that we could standardize and completely develop components that would run right through c/o?

Major Farnum, I think that the way we have attempted to approach this is to allow ourselves a sufficient flaxibility to incorporate changes either here or at the base, when modifications are indicated as a result of flight test. Now, the kind of thing which would make a real schedule problem would be if we had to go back and pull engine, or pull tanks, or this sort of thing.

I think the engine pulling would probably be the biggest one. We could change tanks in a matter of a few days, and we would be ready to go again. to date, we could do that too, where desireable.

(could not coordinate rest of this man's dissertation)

Would this also include such minor items as the guidance computer, for instance? Where you can't do any of the checkout until you've got this debugged if you required an engineering change?

Richter: That is one of the problems. That's the reason for the computer time span. I do look forward to the fact that by the time we have made a few more of these computers, we will have more and more of these bugs removed, prior to manufacturing. For example, back at the time we made 1019, we essentially built the computer in the mod area . This has come down to where we are doing an extensive amount of changing still, but is perhaps 30% of what we did on 1019. This is just the appearance of the engineering knowledge that has been picked up in the meantime. Now this will eventually go out.

O'Green: I might to add to that by saying that in this area, in addition to the work we do in mod area itself, these additional components for the recount were actually designed in R&D. We also build them on a non-manufacturing basis, for we build them more as a single component, or two or three components, until we work out the problems of flight components and drawings suitable for manufacturing, and these drawings then are now being trimmed and inspected for standardization for the manufacturing area, and we expect the product to be much more uniform, and much more

Fallon: Really, how much do we know about this computer or guidance system.

Nothing until we launch a couple.

We don't visualize difficulties here. We have done all of the checking that we can on tables and so forth, and by equations for instability, and we can tell from the things we see right now the general system response that this is not an unstable system which is marginal. We think it's OK, and obviously when something is in free-flight, it's going to respond differently than the way it does here, not only in mod and c/o and Santa Cruz, (garbled)

Did you check with some of the experiences of other guidance manufacturers? for other missiles?

Certainly, we have people who are aware of this kind of difficulty. Everybody has difficulties.

What kind of experience have they had? Have they been able to de-bug completely on the bench? prior to flight?

They have not. I think everybody has had problems of this kind. I think that the pther problem is that at the rate which our program has been stepped up doesn't call for any   . Most of the other programs have gone about their guidance program on a step-by-step basis, where the guidance systems are not even flow for several flights. We are stepping up the guidance in No. 1 and expecting it to work, and I have to admit that this is not the best approach, but is the required approach, and is the only thing we can do. I don't feel that there would be anything gained, if we had not been so particular about it. We're without modifiers in our system, as you know, and the guidance system has been stepped up to do it.

What I'm trying to   to--I'm not sure in my own mind that we are being realistic, in view of the experience that you have had, and that other manufacturers of similar equipments have had, that they don't factor any contingency for such problems. There is an optimistic scheduler that doesn't account for any problems that we might uncover, or major redesign of critical components.

That's right, Mark, but how much time do we want to factor in? You could put a time crank figure in there and not be able to defend the thing.

Richter: I want you to know that all this guidance stuff you worry about--these times include the full composal (?) of simulation and analog computer simulating the external forces, which is one of the ways we are ~~making~~ hedging this thing, and if we find that the equations are out, it's not really difficult to go back from here and change the things and build the system up again.

That's done with every bird you know.

There's one thing some of our other brains have done on flight birds.

McLaughlin: Wouldn't it be better to use the schedule that you have shown there and then if you get into difficulties, use this other schedule which calls for the 7 day week, 3 shift day operation to work yourself out of the difficulty?

(Murphy): John, this is a scheduling equipment contract, that's what the problem is--we'll work internally into the other schedule.

But don't you think this would be a better approach? Contractually, you would put in maybe a realistic schedule, and on the other hand internally work to something that's better than that.

The only problem that we're facing, we want to hold the flights at least through June, and we will do out best to do it.

Well, I have no more guarantee that the difference between these two is realistic, than I could tell you what day it was last month sometime, because the figure is purely open to conjecture at this moment. On an experience factor you say it is not enough to afford you realistic numbers of days for trouble-shooting and debugging. I'm a great one to have pads on/and schedules, believe me.

Don't misunderstand me--I'm not asking you to pad the schedule, on the other hand I think it's rather foolish to have a schedule that you know is more or less impossible to meet and and have to amend the contract, on a month-by-month basis to bring it back into line.

You're not reading the magnitude of our determination to keep on our schedule.

Mark, I'd like to add another commenttoo; that is I think that you don't put in a schedule that you can't keep, but you put one in as tight as you can, andthe other point here is that the results of the of this program are going to be from flights, not by sitting around thinking about it.

I would much prefer to have a contract schedule, and a tighter internal schedule for bbvious reasons, but we have some associated problems here that are quite , because if I should come along and by chance meet the internal schedule, it won't do a bit of good unless the associate contractors aren't also on that same schedule.

Couldn't this be resolved by setting up your need dates for other contractors to meet this internal schedule?

I'm talking of the booster contractor, as an example. If this doesn't afford a problem to others, it's no problem to me. But I assure you we are going to work to the schedule.

Now, this is fine. What has been your experience -- it seems to me that beyond the first few vehicles expecially that you don't gain a lot by going on a 7 day, 3 shift schedule -- sometimes you just have to sit around and think a little bit about some of these problems. and that actually this is what you're inviting here -- that you're spending time and not actually accomplishing very much.

I think, Mark, that we're enough downstream with hardware and hardware design, that this is not entirely true. It certainly is not the start of a program, there's no question about it, but I think there are designs in our production where this will pay off. The whole program is an accelerated one, and all we're talking about is another half-inch on the problem. It's been an accelerated one for the past 14 months.

Don't you think that you ought to to returns on output?

No, as a matter of fact, we've been giving the place quite a rush for the past couple of weeks.

Well, I didn't mean to be facetious, but my remark means that we have had our overtime cut down pretty drastically this past week, and Richter's boys have had a few hours at home for a change. Now that they have had a chance to enjoy it, we're going to take it away again.

I think this probably proves what I am thinking— that you probably have felt you were behind schedule right now, and probably the only reason you relaxed was maybe we are getting

I'm sure that the overtime

I guess the net result is the same, Mark. Over a long period of overtime, the men seem to pace themselves at a much lower rate, and they cannot keep this up, as their per-hour productivity is not the same as it is on a normal eight-hour shift. I think overtime becomes non-productive, after a certain point of time.

I think there's another point that goes along with this [redacted]
(entire dissertation was garbled)

and that is, excessive application of time

when you don't have the hardware there to work with, but we do have the hardware. The thing we're doing now is learning what is going wrong with it.

Now when we get down

the people are sent home, and the people who stay there fix it, and this way the work goes better. A continuous operation is required in order to take care of these one-by-one

I think the philosophy of concurrence is with us at the moment, because of the acceleration we've had on the program. It has not always been an orderly overtime in orderly progression of things. Things take place in turn with other things, while this conserves time, you can argue that it is dollars, because what you are buying with dollars is actually time.

Rick and his boys are trying to work around the clokk on this thing; of course, the whole department's trouble is that those areas on the computer are going to take the largest amount. That's why we want to put three shifts on. But we prefer to go 3 shifts rather than go two 12-hour shifts. When we say 3 shifts, we talk, or rather hope for 3 8-hour shifts, where this is possible. But lacking in sufficient numbers of trained and/skilled people/initially to get on this thing,/so we can split them off, /we may have to go on some 7-day overtime.

I'm mindful of the overtime problem, and the lack of people, and it's easy to associate it with long periods of overtime. We're trying to get around this situation.

I thought the premium cost would probably be the second consideration, on the other hand, I'm not so sure that you're setting up a real optimistic schedule which you don't, in some cases, defeat its purpose. If you get too optimistic, and attempt a schedule which is not really attainable, you   , too.

There are about as many scheduling philosophies as there are administrative/philosophies. Somewhere between the two may lie the actual clue   (Gargled) but with a combination of scheduling, Lockheed has a fair amount of realism, as well as a hard headed administrative approach, some of these things may be accomplished.

Don, some remark was made a while ago in reference to the reduction of the time at Santa Cruz by one week. I understand that there is a six-week set-up at Santa Cruz. Do you in this six weeks at all?

Gyros, for instance. We are having a very bad run of gyro failures, and these will swallow 2 or 3 weeks very rapidly. About 3 days for .... to replace and get the package realigned.

Q Well, Mark, let me ask a further question on that, for clairfication. When you said that, were you also including in the shortages this computer, for example. That's correct.

... the computer, the IRP, horizon scanner, and the associated JUNCTION ~~Johnson~~ boxes and the secondary parts that go with that. Almost entirely SS/D.

O'Green, I'd like to add a comment here. And that is, if these components which we are talking about, these electronic components, were available on the time it went into Mod and Checkout, we would be able to meet our Mod and Checkout Stand... So, it's just the fact that they are not installed....

It's a fact, they are not available. That's right. They have to be replaced.....

Major Orr, here. ... investigation is going to be around to find out how you can alleviate these critical shortages. I'd be interested in knowing evidence you intend to take and what you expect to get out of this investigation.

The probability ... these shortages which are critical ones are really stemming from our engineering problems. The computer itself involves many functions which are tied directly to what the bird's doing when she is orbiting, and the way in which it achieves orbit. There are more changes which we are coming up with, things that we learn in normal course .... of our system..... is the particular component after .. stages in the course of the bird being released. Therefore, some of the last changes that we have

So far, 60 days after we get the computer back and able to get one out......

Murphy, I want you to understand that this is not a main question. We dont hold any...... for this one. I understand that.

...... Yes, but there is an input that he needs, and it isn't any .. problem. Have you taken this up in Mod and Checkout?

This is Pritchard, the 1050 delivers on 2/25 and it will be about a 20 day delay for the computer. Then another .. or .. on top of that. Right.

Don Smith; the computers are available, but the integrator .... is what is holding them up.

We can discuss the computer problem further, if you like.

No, when we get to Mod and Checkout they will probably ..... has the computer right now...... We we are trying to get a field for the average condition of these vehicles as received by Mod and Checkout. They felt that this extended .... because if they weren't clean, those received to date and contributed towards the delay getting vehicles through Mod and Checkout. And if so, how long?

Q Burke, did you happen to catch this question?

A No, I'm sorry I didn't, Don.

The question was whether or not the shortages existing on the vehicle at the time you received it from manufacturing has been the major contributing factor to the delays in getting out of Mod and Checkout.

The total shortages on the vehicle, Don, if you include the things that aren't in manufacturing, that does not normally install, which is all the electronic equipment, and all the guidance equipment has been the major contributing factor. That and component theories.

Actually, if your tank problem was solved, you'd be ahead of schedule, wouldn't you? ......

He's in good shape,... tank problem gets solved.....that, of course, will be a problem..... Accelerating at some later date in reference as a whole.

(Transcriber's note: The above portion was interrupted by coughing and was not transcribable.)

That excludes the possibility of...

Getting back to this 1050, this major problem, 1051 and 1050 in this proposed delivery, 213 and 225, are these going to be cooled complete, or will there be shortages that would extend the period of Mod and Checkout.

It could extend the period of Mod and Checkout.

....the exact condition that will rule, but....if there are any shortages.

Q Will we have....,horizon scanners, ...

A I think you mean the Smith are better equipped with detail answer for this than maybe Nick. Do either one of you have an answer for that?

A I have, Smith, I have the answer on that. If the short scanner the stand and radar beacon on 50 but not 51, and also the transition computer.

This is not actually what I'm looking, is not the details as to what parts of this, but what would this do to the normal time period afloat to Mod and Checkout?.......

This is Nick, the computer shortage is an extending job. The other can fairly well be swallowed to some degree, but the computer is.... because it determines the portion ~~af~~ to hold SS/D.

From your experience to date, the condition that you'd receive these ...., what length of period would you say this extended your operation in Mod Checkout?

I guess I missed part of that.

Q Does it make a real lot of difference to as which four flights they or which four flights according to the schedule it might be.

A ...... without any consideration given the way they appear schedule wise. It will make a difference to because we will have some difficulty perhaps in bringing...after we get to a given position in our program, we have two kinds of payloads remaining, depending on which ones you want where, we will have to ... that our payloads were available. As they would not affect the cost in which you are talking about as far as the birds are concerned. Yes, I get your point. If we were to take, for example, if two of the flights we drop out were to be two, for the sake of argument, we might have scheduled in June, which as a matter of fact they are moving the remaining [illegible]es up in a month, we may not be able to do this. This is only a point of [illegible]ation and is not necessarily a statement of fact.

Q Are we in a position to tell them which payload we've got?

A Well, this......, but I think thats a pertinent point there, something we will have to consider.

.. beginning with number 11 on through 19 are not definitely scheduled up to date into Mod and Checkout.

Q Would it be safe to say that any of these are subject to acceleration, or are there some specific ones that can't be accelerated.

Murphy, I'm not real sure I understand your point.

My point is this, that as an example, we quote two payloads out that were to be flown in June, we are probably restricted to certain of these birds, that can or cannot be accelerated to take up that slack in June.

I don't think it's too much of a problem, is it Nick, if ....

to incorporate in the bird are actually the component. Now it turns out that this component also adds a design deficiency in that it is not a very flexible one to abide by. But we have an actual difficulty in getting into it and sorting out wires and getting rid of the number of wires and the number of parts to make changes, in correcting where it is wrong. Therefore, it not only comes in as late engineering information, but the actual accomplishment of the change in that it will take a long while.

So, the things that we are doing in this area are things to improve on our .... so that we will have this flexibility. Likewise, to try to tighten up on the number of changes that we will allow .. Now some of these .... that we want to make and the Air Force wants us to make. Maybe that we'll have to hold these up for a bird or two and then incorporate 2 or 3 of them at once, rather than try to incorporate them on a step by step basis. The other problem we have is that some of these components are made in ... , and some of these components are subcontracted .. and we are now with the staff force that is being set up... along with People from the Manufacturer organization or from the Purchase Organization set up our quota ~~[illegible]~~ tables for each of these components, so that ... will know exactly what.. what must be accomplished at each station stop, ~~[illegible]~~ the equipment shortages .... These are the steps that we have taken.......abreast of everything else. We are formulating that task force right now. And it should be operating within a couple of days.

We have 6 days there to change control, committee. Sure do, we have a change control... which is operating under Ray Proctor and Tram Pritchard...... Trams actually chairman of such a committee. And the way that I've changed control functions is that the engineering changes .....

....to determine that and once we determine, the effectivity we turn it over to change control process through normal change control functions.

The steps that Fred is taking are usually very effective and I urge you to remember too that they are usually very effective on a production line type basis this is the early stage of an accelerated R&D program.

Q Are you taking any steps to streamline your procedures then and shorten your time from a design release to Manufacturing?

A . ....from design release to manufacture is almost immediate. It's just a matter of getting the prints to the print room and into the hands of the Manufacturing people, where they have already had in working with us and then into their planning organization. This I think has been accomplished over a period of years.

I must admit that the figures are sort of cumbersome and we...

I... that the actual changes that we want to incorporate in a piece of equipment once made is a troublesome thing to accomplish because the design wasn't flexible.

Anybody on the here, have any further questions? In regards t0 Mod and Checkout?

Well this 24 and 26 you've heard about, we have five birds in Mod now, the first one is due out Friday. This is possible if we don't run into major failure. 1023, the second bird, was apparently due on the 10th of March and we estimate at the moment that it is about 4 days behind schedule. 29- we still have not received this computer we've been talking about, and to our best experience that is probably going to run something like 18 or 19 days behind on the ferret .. 25 and 28 we do not have firmly on these womponents and any reasonable estimate is pretty hard to make. The problems that we have are largely in the guidance area. The guidance systems growing XX and each bird has more parts in it systemm and there is a great deal of development testing yet to go As an example there is about 300 hours of running time on IRP before it is cleaned up and ready to go after we receive them. XX. The 1020 which is getting ready to leave, we were critically involved with gyro failures. We had three gyro failures, each one of which accoumts for three calendar days, because of the necessity of taking apart, putting in a new one, re-aligning the axes, recalibrating the whole system, and re-running the entire guidance system. This component failure problem is I think probably our heaviest one outside of late delivery. The computer changes were mentioned, schematically they are comparatively simple but physcially they are very difficult. They give you a fairly long tieup. On this basis it looks like the 28 unless we get some relief on components and delivery, MMX we will be approximately three weeks behind our schedule and there is very little chance that we have of making it up. We are running on a two shift basis now, 6 days a week, in all the critical areas and there isn't much more we can do about that.

Did you ever think to examine the Mod and Checkout procedures to streamline this effort and maybe pick up some time ?

Not that we have been able to find. If we were running on a production basis it would be comparatively easy to streamline it but actually this is still and R& D system and these elements are still very definitely

R & D and we have problems that will come up with a thing like that - amplified operations, ground within an IRD which is supposed to be like the one that came through before , and all these myriad little things which I'd be glad to show you in detail, that hour a day or two days at a time.

Sounds like you almost have a different procedure for each

We have a different procedure but in order to go from step to step to achieve the results you want, remembering now that we are now working on the third, actually only the third guidance system. Each time you go from one step to another you will have another set of problems. We are not having any trouble with disposing of the ones that have been solved but what we are looking at now is the differences between birds. They aren't substantially different - this early in production they are very much different.

Do you pass your findings then along to and Vandenberg so they can at least use the same type of procedures which you use to run their assembly checkout?

This is correct. We give a full set of our procedures to results and

This is Major Zalanka .To get a basis to start with here can you perform a similar exercise on board with respect to what you have in Mod and Checkout at the moment?

Sure.

What's scheduled then.

Could you 22 and give us the date in and date out?

I think Tram has it. Do you have dates in and dates out on the birds we've had through with you?

No, I do~~n~~ not have them with me.

Well, can you

Well, ~~XXX~~ why don't we just back up from here and let ~~XXXXX~~ somebody that. I guess we can take that off the board.

O.K.

You got these first ~~XXX~~ couple on?

How about 18. You got the ~~XXX~~ in and out

~~XXX~~ 18 was on 11/30. Then it went out on 1/12.

And this is estimated at 13/13

23 came in on 12/6. And we're estimating 3/10. 29 came in on 12/29. Doesn't sound right to me at all.

Would you read some of those out so they'll get down in the record.

Yeh, I'll read them out, just a second .

I don't have the dates right here at the moment for 19 and 22 and I've skipped 24 and 26 they are inactive. 1018 came in on 11/6 went out on 11/12. 1020 came in 11/25, out 2/13. 1023 in 12/6, estimated out 3/10/ 29 in 12/29 estimated out 3/30. 25 in 1/16. This is a rough estimate because we don't have from here on out on components. Estimated out 4/20. 1028 in 1/29 estimated 5/11. ~~XXX1~~ 1051 estimated in 2/13.

Would you put up there the ones that have guidance computers?

The ones that have guidance computers?

1018 which is gone. 1020 and 1023 have guidance computers.

1029 is estimated at the end of this week.

Are these in the order of flight?

These are in the order of flight/

... on 1019 in to Mod and Checkout on 7/14, out on 9/19. 1022 into M & C/0 on 8/5, out on 11/4.

Do I understand you to say that a minimum of 60 days would be required after you receive the guidance computer.?

This is roughly correct. This is pa[illegible]y dependent upon the amount of trouble we have with the system. We have run as high as 64 days and we have run as low as 52. When I say 60 this is an approximation of what we are looking at at the moment.

According to that then your out dates wouldn't be too realistic.

Well these out dates are based, since we have no choice, on a crash effort to pick that up including 7 day a wwek operations. It's the only way of picking up

better than 60 days?.

We are going to better than 60 days by getting the extra shift back into it, yes. We are working on a 6 day basis now and we can put that up to 7 per period. We have done it before.

One thing that might be pointed out here is that people in Mod and C/O have not enjoyed the experience of having vehicles yet and there is nothing really beyond

Isn't the payload

The payload proposition has not entered very seriously so far and that does not tend to so much as changes XX in the basic system.

This is Major Zalanka. You say 24 and 26 have been set aside. Therefore the listing you have here beginning with 1019 is the actual program order of flight, at the moment?

This is correct.

24 and 26 actually sat in XXX between 1022 and 1018 and is completed. But when I said they are static I mean they are in the area but they are not on

This is Ray Barnes. I understand you have not employed up to this time, is that correct?

This is correct.

What has this intruded into your problem ?

In the first place I don't believe this is at all under the differences in vehicles and the basic fact that we are, at this date, an R&D program, primarily troubleshooting. Automatic equipment is of a great deal of use if you are running duplicates but we are not running duplicates so far so XX the programming tends to offset the timesaving at this stage.

This is Ray Barnes again. What other checkout equipment difficulties may have contributed to your problem?

This is Richter. We don't have any basic checkout equipment difficulties other than the normal that you would run into in a program like this. The first time we used the equipment there was a great deal of servicing and rework going on and we are still having some failures XXXXX in it. It is not, up to the moment, a critical item. It will become XXXXXXXcritical as we move down in here and try to take this schedule out. Then an equipment failure would become very critical.

This is Murphy. Would more checkout equipment be of any benefit to you?

In some areas now it would.

Would it help you in that computer problem?

In the computer area it would help as we add another step of computing checking equipment on the way in because at the moment it is a very serious bottleneck . If we had a failure for instance, in testing 1020 computer we would have to repatch the computer checkout equipment from 23 to go back and we have taken steps to take this one out. We have picked up a second set of guidance equipment which is just now becoming active which will help us out in this area but there are limitations on the equipment particularly on some small parts in the guidance and instrumentation. We are very limited in instrumentation checkout.

This is Fallon. What is you lead time on obtaining this checkout equipment?

There is a great deal of it in process.

Do you have some estimates of when you want to obtain this checkout equipment?

The guidance equipment is all on order and XX most of it is in the room. It is now being serviced and put into use. I would estimate that in 2 or 3 weeks we will have most of that running. We have some more instrumentation equipment in process down in Van Nuys that should be appearing right around the first of March.

Major Zelenka. Your time in to time out span there looks like 3 to XX 3½ months.

(end of record)

Second side of record.

It may be but we don't know it for a fact. We don't know it well enough at the moment to schedule it out. What we are sort of saying indirectly here is that if there is any in Vandenberg schedule it might get soaked up by some slips in this schedule.

(Everyone talking at once)

This bird schedule would have to be more or less.

That's right.

Also a couple weeks of clean up too.

Mm-mm.

Want to get Naegele up on the stand here.

Farnum. In Mod and C/O how many positions do you have and how many birds can you work on concurrently?

We have five in active work at the moment and there are two system checkout positions, two guidance checkout positions and the rest of them are miscellaneous subsystem checkout and rework stations. We actually can process two at a time through all the hard area.

So that would be a total of 7 birds you can work at on one time?

Roughly 7 birds yes. You can rearrange this depending on what you are doing. But your critical areas are all XXXXX capable of handling 2 birds at a time.

Is anybody at Vandenberg more positions of checkout equipment?

I think there is a maximum physical space limitation here in the area.

There is a critical space limitation, however, the current critical area concerns people. It does no good to have guidance checkout stations if you don't have trained people to run it. IXXXX It's not a technician operated basis and I don't foresee that until you are way off this board.

Any other questions?

No, I think we'll call it XXXX quits for today now and I think both the recovery area and tracking station areas tomorrow will be fairly short. We will get most of our information at Santa Cruz and launch base problem and get that off tomorrow.

(Talk of scheduling meeting for tomorrow.)

NOT LOGGED [redacted] 2/10/5 [redacted]

This is Major Plummer, and as a follow-up to this I'd like to talk specifically about the difference between the 1022 and the 1018 of which less than 4 weeks is shheduled and with 1018 being the first UDMH vehicle this represents the maximum modification to Pad ~~time~~ (excluding damage and other modifications because of plumbing changes, etc.) This has been estimated, if I'm not mistaken, at 800 man hours plus the necessity to have a systems check prior to the dress rehearsal. and is accumulative time It appears to me (without any pad rehabilitation from damage of merely GSE plumbing pad hardware, plumbing, modification, etc.,) is in the neighborhood of 22 days. And yet as total time between launches it figures out about 25 days there which appears to me about 3 to 4 weeks even though the most optimum figure.

I don't know what the situation is with regard to our/official schedulings as I brought out before, I don't know how these were established, I certainly haven't concurred in them, I positive the flight test wasn't ______________. This is only 22 days actually here, there are 28 days in February.

This is Prichard: Originally the schedule for I believe 2-18. This was the agreement we made with . Scheduled 28 days between flights. Thats the dates. Originally put together this way. Obviously with the new

---

This is Maj Zelenka:

I think that the point here is that there seems to be a possibility between 2-3 and 4 of ______ the month. The comment has been made that you've got 8 more days there If it isn't scheduled on the 18th - I guess thats 7 days - add 7 and 19, that makes it 26 and hopefully you could add 7 to the 15, that might be the 22 - you'd only loose 1 more week and you've lost a month somewhere. _______________. I think its just the recognition that its damn tight. the possibility of losing 1 flight ___________. Of course we may be lucky .

[redacted] [redacted] WDZW 59-214

[redacted] [redacted]

We may not have ______________ in the Pad. We have all the spares. We're prepared to go in immediately and do the work. I think that if I were doing it from the Air Force point of view at the present time I would continue to schedule that one for May, without attaching a specific date to it.

This is Major Plummer again. You mentioned you had the spares available - what is the spares situation for pad rehabilitation for pad 4? For example, you mentioned that the damage ~~xx~~ on the Thor demonstration was light but had not been repaired. I don't know if the reason was spares, spare parts, replacement items or not. What is the spares delivery situation at Vandenberg?

We have ____________ everything that we think we will need to repair the Pad.

Now is this 100%? ~~100%x~~

100%.

This is all at Vandenberg at the present time.

(Maj Plummer) I have another question - as to whether or not subsequent to the demonstration launch has Lockheed received any input from Douglas and taken any action to harden so to speak or make any types of modifications to any of the unbilicals or any other item on the pad to reduce the damage?

I don't think so, Maj Plummer. We designed all of our equipment there because of what we estimated to be the damage. Presumably when it was designed initially, it was designed to provide protection to the extent it was ~~xxx~~ considered economically feasible ; or desirable to do so. Now our GSE people of course made a very close investigation of the damage area when it occurred. As to whether any modifications have been made to the designs - individual small items perhaps, I really don't know. This is in our GSE Dept. area and my impression is we haven't really modified the design because in most cases it would be difficult to procure within the month period we anticipated ______.

I don't know of any specific designs ________________ as a ~~xxx~~ result, either, but I do know that our people were there and looked for these type of damages so that they could be properly incorporated. One thing about the Pad design, the demonstration shot is somewhat different from ours. [redacted] the details ~~what scale~~ but I understand that the

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[redacted] [redacted]

protective walls and some of the equipment that goes on in the closer __________ than then our pad/in the demonstration shot. So there may be more damage in those items.

(Maj Plummer): They have tops over most of their - roofs over a lot of their GSE for example and of course they have the wet pad, but there is a dry pad at - Patrick I understand that they have used and I was wondering if we have any input from experience at Patrick as opposed to mere engineering design as to what this damage might be. And the reason

From Patrick you mean?

Yes.

Yes - our GSE design people before they design the equipment that goes on the pad coordinated with Douglas and obtained from them their estimates of the type of damage that they would ________ and how far the flame would go out and so forth and they based the design on that.

(Maj Plummer) Well the reason I'm pursuing this further is I have a letter here from Douglas dated 5 Feb which lists the number - four or five pages and it looks like there might ten items per page- on the various things that they are doing at the present time in the Discoverer Program to minimize the launch ______________________________ damage and the information source for most of these are from the Vandenberg as the result of the demonstration launch and from Patrick, and included in this thing is lots of _________ which has been mentioned before, a number of additional nozzles for water _______ and I was wondering if Lockheed had received this information from Douglas and whether or not they were taking any action for Lockheed/equipment similar to what Douglas is now taking for Thor equipment.

I have not seen that - I don't know whether it has come into our shop or not./(All taking) I can check with ____________ and see. I would suspect that he does have it and that he is probably taking action accordingly. (Maj Plummer -)I will be glad to show you this paper.

[redacted]

[redacted]

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[redacted] [redacted]

I might correct a certain something that I think ____________ may have ~~xxmxxt~~ wrong - the launch facility ~~xt~~ on which the demonstration shot went - is not a wet pad.

Maj Plummer: Then I am confused.

It isn't a wet pad like the AFMTC wet pad but it isn't like ours. They do have water on the thing and its up 5 feet or so ______________________ it isn't exactly likeours but it is what you'd call - It isn't a wet pad, ~~ixxx~~ - in the sense that there is not water on the flame _________ or something like that but ~~ixxxx~~ the effects of the blast I'm sure would be somewhat different because there's at least a place for the junk to go, it doesn't just sit there and blow around on the ~~pad~~ deck like it does on ours.

Maj Bumm: I think ~~ixxxx~~ there's another _____________. On the - I think there was a diversion of the Douglas effort after the demonstration launch to our pad - they did not receive any great amount of effort to bring their pad back in __________. Well you cant compare their repair time to our situation.

This is Weaver again: You are counting on Pad 5 in May. Do we have any definite word as to what day in May - whatpart of May and how firm is this? We have two shots in May. The last one on the 27th. We need 21 ~~dxyxxx~~ days on pad.

I'd like to comment on that. Our present schedule time for this is ~~4x30x~~ 4-30, April 30 and we have some of our equipment which are a little bit behind this now and some which are a little bit ahead. My last reading on this is that it will be 4-30. ________ do you concur with this or disagree?

This is Pritchard: The 4-30 date is predicated on ____________ fire inApril. This 4-30 date means that we will have a pad finished just like we're ~~talking~~ concerned about the 12th (?) of April. 4-30 was the fire date then. 4-30 was the ___________ possible fire date. That's not the current schedule. No it isn't. No. This was activating pad time schedule. Let me correct the misimpression for a moment. These equipments which are under design and being built as originally contracted required pad completion for firing ____________ and my instructions in my shop were that we would meet that and have a firing date

xxx [redacted]

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[redacted] [redacted]

available for April and those are the schedules that we have been working~~xxx~~ against and that's why it was established that way. And the flight schedule I recognize has __________ this way but our attitude was that we should meet this with our equipment to the extent possible so that they would be ready at the earliest possible date. That's how we got the way we are.

This is Maj Plummer again: Is there a joint Douglas/Lockheed pad activation schedule which gives this date?

Not in detail as yet.

I would like to go back on this thing. We have ~~xxxxxx~~ always scheduled~~xxxxx~~ April __________ for our __________ and ______ been/in our plan that the first ~~xxxx~~ flight would be in April. During the course of events the last 6 months to a year Douglas has not really taken this to heart in some respects and it ~~is~~ has not , I don't want to be quoted on this, really gone into too much detail on it ______________. Finally, about, I would say 3 weeks to a month ago the BMD Project Office had a session with Douglas at which we were invited to sit in as spectators. When Douglas came into that meeting they indicated that June ~~is~~ was the earliest date that they could have pad 5 ready~~x~~ for flying 2 a month. Pad 4 and 5. This is as it was reported to me - we didn't take part too much - we were listening. Douglas then decided that if certain things were done - and they finally at the end of the meeting agreed that they could activate the pad and be ready for 2 flight a month in May. I think one of the things that led them to say this was that the Air Force had agreed to give them ~~a~~ another building at Vandenberg. At the end of the meeting it was indicated to us that Douglas would establish May as the month in which we could have 2 flights. We have been then minding our schedule and checking our delivery dates with equipment and so on and considering difficulties in the other pads and so on we have accepted May as the flight date for Pad 5 and this has been presented to BMD by Don Murphy and there has been no reaction from them. So we have no other basis then to assume roughly in the middle of May for capability to fly on pad 5. We quite recently had the schedule of our work to be don [redacted] rankly forget the date on which we expect the facilit [redacted] checked out - some time during May - I'll get that schedule

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[redacted] [redacted]

and give you the date - ~~xxxxxxxxxxxxxxx~~ unofficially if you wish.

~~xxxxx~~ Ralph I think I'm ____quoting____ that schedule for you because/none the equipment ~~xxxxx~~ which are being designed and being ~~xxxxxxx~~ checked out down there by the GSE people are the ones that were made after the meeting ~~xxxxx~~ your talking about. The schedule ____________ is talking about is the one that we'll presently meet. And those equipments ~~xxxx~~ wont be delivered down there - now as for the checkout that your people are going through and entire ________________________ or something,

As far as the GSE part is concerned were shooting to have our completinn in April. The Douglas date, now let's see, _______ the 2nd?

This is Maj Zelenka: For your own protection here if you desire to make a statement you dont want/recorded or transcribed ~~txxxxxxxxx~~ so indicate and the girl/

DOUGLAS
LEAVE OUT PART ABOUT ~~xxx~~ MEETING W/BMD?????????

only quoting what my representative told me.

This is Weaver again: What is the minimum time, assuming 2 pads are available/ to us, between firings? You have ~~xxxxx~~ personnel problems - you have equipment prpblems - what would be the minimum time between firings.

I would say that an absolute minimum would be a week. I certainly would like to set up a schedule so that there is 2 weeks between. We will have duplicate equipment ~~xxx~~ as far as that goes and the pads essentially will be independent but we cant always duplicate people and the ones that have to pass on things and have to be held responsible for things.

This is Maj Zelenka: Now that you've brought the people part of this are you facing any problem of getting the extra people necessary to man the pad 5 activities? I realize 2 ~~xxxx~~ full crews are not necessary but we do have personnel requirements. What is your position on that at the moment?

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[redacted] [redacted]

[redacted]

Do you foresee any real problems in the [redacted]

We will have our problems. ______________selective about the people we're getting. In my last discussions with the base as of last week they indicated to me that they will not have any difficulty hiring the people. Unfortunately we'xx got off to a slow start in Dec. __________budgeting because of our negotiations and actual authority for how many people we're going to have there. It delayed us somewhat. But in the activation of pad 5 we are going to make use of transporting from the Dept. xxxxxof the development division . We already have Bob_______ investigating where he can procure technicians on a temporary basis from Sunnyvale and/Van Nuys and so on. I think that we'll be able to make it alright. I do think, however, the people should be prepared for a H____________of use of overtime at Vandenbarg, because we have been xxx faced with setting up minimum schedules on this and it isn't quite that easy to get all this equipment checked out.

This is Hayden: Ralph, I don't think extensive use of overtime at Vandenberg is your only solution. I think more people have to be _________.

Well we have authorized more people./- I thkxk think that everybody should appreciate the fact too that the requirement for working together with xx another contractor on the base - and this is positively no criticism of the other contractor. It's always going to require overtime./ During the month of Dec and Jan we were every single d----- day were faced with the prospect of gxxx going out in the morning prepared/to make some kind of a test with our full crews. And there was a delay of some kind because Douglas had to continue a fuming test. They would have difficulty with the repeater or something like that. Those people have to stand around there and wait until they can start work. And most of the time this occurred at _____________during the day. And we had people there who were there since morning waiting for thing to be erected or to be mated or something like this and I had to/authorized overtime to work 4 or 5 more hours that day. I think that during the next several months - the start of this program, and activating the other pad - and vehicle models and so on, regardless of how many people we put on thxx the force we're going to faced with a H-----of a lot of that.

[redacted]

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[redacted] [redacted]

This is Maj Plummer again: On the ________of the pads on the newly adopted procedure where both Lockheed and Douglas will go in simultaneously and repair their portions rather than one contractor doing this as was originally done when Douglas installed the Lockheed hardware - do you anticipate any problems because of space or personnel and availability of the equipment ____________________, and so forth.

I anticipate no problem what-so-ever. As a matter of fact I think it will go better. As far as the Douglas and Lockheed organizations on the base are concerned they work extremely well together - and are good friends and I don't think there will be any difficulties.

(Maj Plummer): I was thinking more from a scheduling standpoint, where it would be necessary for both contractors to - say- be~~e~~ in the same trench or the same general area at the same time.

: don't see any reason why there whould be any trouble at all.

(Maj Plummer): When do you anticipate that you will have your schedule - your installation schedule to Douglas for this joint pad activation schedule? Here I talking about the delivery of the pad hardware, plumbing items, things of this type and certain stages of completion that must be met on certain dates for ~~the~~ establishing certain milestones so you can start your checkouts and so forth so that when we get to this in-dates, in other words what I'm getting at is you can't just say by the last day of April we'll have all the GSE there, because of the __________action and the continuous checking problem. When do you think you'll have this schedule to Douglas as far as the

Well I suspect that they will really get into this in great detail within the next few weeks. Its only during thelast week,actually, within the last 10 days, Bob _______of our GSE has gone down to Vandenberg and we ______________and determined that this dept. will do this and that dept. will do this and we have the console schedules ____________for a certain date ____________. These things have to be worked out at the base in detail between the 2 organizations. I suspect that perhaps this has been the neglected ____________situations regarding the firs [redacted] I intend to see that this integration is done.

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[redacted]

Maj Zelenka: This is sort of going back to Santa Cruz Test Base, but, as I [redacted]all in the post-mortem on 1019 in certain corrective actions to be taken there was a desire expressed that we more closely simulate at Santa Cruz those things which will occur at Vandenberg. Will this have any impact at all on getting 1018 out of ________?

I'm afraid we can't comply with the desires for much closer simulation because the sequence of tests that we perform at Santa Cruz are strictly tailored to the flight operations sequence. We have no way of duplicating with any degree of authenticity any of the functions that would occur on the vehicle during the countdown because we just don't ~~know~~ have any of this gear - its all at Vandenberg - not at Santa Cruz.

I would like to ask a question here - I don't recognize anything other than discussion on this point, Ray.

Maj Zelenka: I'll go back and restate what I said. There was a desire expressed that if this were possible that ~~we~~ you more closely simulate the actual conditions at Vandenberg while you are going through the Santa Cruz activity.

I think that in the discussion with ____________ that I entered into was that the point was made by some individuals that there were also points made on the other side that this wasn't necessarily the correct think to do.

This is Kane: Probably as a hint simulate the countdown at Vandenberg as I mentioned at Black Friday cause we dont have the same controls, we dont have the trailer, the J-boxes, we dont have the 59 feet of line we dont have any of the same equipment esentially at Santa Cruz that we have at Vandenberg. ~~Thex~~ There are certain activities we can go through and will but

This is Maj Zelenka: The only reason I brought it up was that if you were intending to make some changes to go as far as you could. I'm just curious whether it would have any effect on the 1018 and 1920.

This is Maj Farnum: These _____________ that you outlined for Vandenberg is it predicated on a 2 shift 6 day a week- is this right?

No, there predicated on a 6 day a week [redacted]rable overtime and a limited second

[redacted]

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[redacted] [redacted]

shift, of items we feel we can logically carry during the night hours say on pad, and so forth. It's not a complete 2 shift operation.

Maj Farnum: Is this the same type operation you've been conducting on 1019 and 1022?

The same.- without as much over time required - I hope. When we approach a weekend and were behind schedule its __________ work on the weekend and Sunday.

Maj Farnum: In some of the discussions with people down at Vandenberg they seem to think that this wasn't too realistic a work week - that there were already signs and indications that the people were getting stale _______ there.

That's right - we certaintly don't like to work 80 hours a week or 74 hours a week either.

Maj Farnum: I understand, like this schedule, all the way through, its predicated on this type of operation.

No.

Maj Farnum: Where could you come back to a normal work week on this schedule. Approx.

May I comment on the Santa Cruz stand.

Throughout this entire operation the the Santa Cruz stand is as I said apparently we disagree on what corresponds to 2 shifts but its either a 6 day operation 6-8 hour days or 6-10 hour days or something like that but certainly there is nothing particularly wrong with a 48 hour work week, as far as a sustained schedule is concerned. I dont think this gets you into any problems of __________ or the people collapsing or ------

Why don't we get back to schedule of 40 hour week like for most people.

Normal work week.

I think that sometime after our first flight on pad 5 I think that we will be in a position to bring our overtime down to some reasonable factor, but if we have a difficulty anywhere near the difficulty we had installing and checking the equipment on pad 5 and so on we had previously, why we're going to have to work overtime.

May I make a comment on overtime on Santa Cruz? for the benefit of my bosses who are not here yet?. You'd of [redacted] for Santa Cruz - 0.

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[redacted] [redacted]

Say Fred: talk about eliminating the testing at Santa Cruz, wondering what impact this has on the Vandenberg operation. or ________ that Many of the systems checks that you do at Santa Cruz will then be unnecessary.

The testing that we do at Santa Cruz is really ________ in the way of systems checks compared to what we do on modcheckout in Vandenberg. Those checks up there are to make sure that you're going to fire correctly and the everything is safe and the few things that we monitored up there are monitored during the engine firing. But I dont look from my point of view on the Santa Cruz testing giving us anything other than an engine performance test, with the propulsion system, and the monitor of those few things that we do which are under vibration such as it is in ________.

From what Nagley said a minute ago about learning other things about the ____________ is this ________ true.

Well this is a philosophical argument as a technical approach to a problem and --------quoted out of their work statements

That's right and I think that we can divert in to the philosophies of where you do what in this thing real easily- I consider the kind of testing that you do at Santa Cruz in a program that was properly oriented timewise to have been done during the development period. The only think to do in mod checkout it see if you made it like the prints - in Santa Cruz you see if the engine burns and check it out and make sure it's ok and fire it. And your development proves ________________. Like if you were in the same status as an automobile - ________

Silberman: To expand on this question just a bit I think the question was what effect would it have at Vandenberg if some tests were eliminated at STA? Say that you run your tests whether they are run at STF or not?

At Vandenberg they have been provided with complete subsystems checkout equipment same as is used is mod and checkout to checkout a subsystem - in complete, individual one. Then they have been provided for the systems checkout consoles - perhaps you've seen it - _____17_____ - which permits a com [redacted] on the vehicle. We will have at Vandenberg 2 complete sets of that. ________ [redacted] anta Crua the

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checking is done essentially with the pad and~~xxx~~ blockhouse equipment. We have 1 or 2 subsystems sets I think, at Santa Cruz - we do not have all of the complete subsystems checkout equipment and we do not have any of the systems checkout ________

We have a little bit for the SS H, B ~~Rxx~~ and also for the engine.

-------Col, Aren't you doing some mod work up thee at Santa Cruz? And doing some mod work at Vandenberg?

We don't do mod work at Santa Cruz.

You don't do any there, but you are doing some at Vandenberg? Yes sir.

I think - very minor items - generally we hope. I might draw you an analogy for a moment which I think/~~xx~~ would describe this thing ~~xxxx~~ ________ real easy for me. If you would visualize our system as having a solid propellant engine in it and the testing that you do is in the mod checkout area and the testing that you do down at the Test Base are the complete test program.

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Side 2 [redacted] [redacted]

Lockheed Dispute on this recording

But at the time that we had this meeting which your people were present and I was present and chaired the meeting now in time these people were ________ About two thirds attending this --------- two flight vehicles a month could come off one stand since the cocupancy of the stand was not three weeks in the stand. But there was time/both before and after the time which was in the stand to be patient for one/thing and for cleanup before ship for another thing. Recognizing that we weren't accomplishing this now we did not miss it very far on No 2 as a matter of fact and so this is part of the planning there. I think that Major Farnum question here is/that there are obviosly many variables involved here. What flight vehicles must go up there and how much testing must be done on the flight vehicle. The continuation of our /PTVA testing how much of its required . What the records are required and what other facilities will be available on a nominal immediate basis if they were not able to properly work these into our ----- effort. All of these things/will continue to ----- and as a result of this because these things were not defined well enough so we could present a solvent gesture to this thing we did not bring forward to the AF /our recommendations to what should happen at that time. And that is just froze good we had quite a few in that plant

to have them burning up and these stands were just burn up because and on the other hand right along with this we/also have a long time problem to fix to because the direction of another stand if this is what we got to do takes a long while. We recognize the shortage of one that were all around in is part of our basic program falling back on the R&D. This is Farnum: I understand this but I personally cant understand how you can speak of anything being so

But I think that the answer that I give you is for and the

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answer that I give you on this one is that regarding to cover last time we took out PTVA testing out the government. And we did this in a matter of just a couple weeks to. This is Major Zelenka: Scheduling If you were considering now the realism of the immediate schedule it seems to me in looking at the overall schedule for tests on all three programs that this problem can't do anything but intensify you what consideration are being given now if any towards stating the requirements for an additional stand? But we have this requirement which is essentially been pulled together and lies in an unfinished state at the present time which could be put together in a finished state and brought forward. I think that now that we have defined better what we are looking for in this new program that we can do this in a much better way. One of the other considerations I did not mention before that the possibility of a new fuel existing, and I think that the way we are planning the program today that this is not part of it. If it does become a part of the R&D program well then I think that other means should be taken to get that fixed. We can formalize our present position for you and bring it forward to you and this will include our estimate of the problem for flight vehicles and will include the GSE situation and the development testing. But even in formulating this you will have to remember this one very big you will have is that we agreed that in some place we are not going to send all of the flight vehicles up there all of a sudden a 50% change in . It has changes completely with what you would want to build in the way of facilities. This is Major Zelenka: I am thinking in terms of looking at the total scheduling how at some point down stream but not too far down stream we get involved in the MIDAS type vehicle, the variety of Sentry type vehicles , and even

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a little bit more down stream pos[redacted] operational types this seems wholely inadequate to cover such a situation. Even if you agree that not all vehicles built at Santa Cruz It seems that there is enough difference in the types that are coming forward that Santa Cruz will be damm busy all of the time. Major Zelenka I think that you are absolutely right and we reached that conclusion ourselves in the presence of---- This is Weaver: Did I understand you correctly earlier to say that each vehicle will tie up a stand for approximately seven days. Will this be the normal stand vehicle to tie up a stand . It takes four days to five and a couple of days to make changes. What is the normal time that a vehicle ties up a stand?

settled the
This / situation referred to the comments from Mr D as far as the amount of time the blockhouse is tied up . It handled the instrumentation requirements of one stand versus another I think is what the question was? yes Now the bird itself has at the stand longer than that there is some
to make to
encounters here that I would like/clarify/flight versus PTVA requirements on
point of view.
the thing from my / . We feel in the same sense that Richter consented to this schedule yesterday, that it is entirely possible that the birds are enough alike or if the tests are simple enough, I personally agree that very likely
to think
/the test band may be reduced to two weeks. This is assuming you are sending
nothing but
/carbon copies of very simple things where our class requirements are concerned , if we remove one from the stand immediately replace it by its plan and go into exactly the same sort of test, now this in my opinion is a little bit pointless unless the plan contract the requirement of which it has no particular technical requirement. On the other hand if we assume that there is
some
/ technical reason for performing the test namely that you are learning something different about the different type of progress I would like to dock off and say that I think that three weeks is certai[redacted], I personally believe its

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very adequate so I think it probably be met without assuming it. to [redacted]
So I don't believe that as we currently know the birds and the test that we are ever going to get in this six months span up here down below three weeks. And this is essentially a three weeks occupancy of the stand by the vehicle

This is Major Zelenka: Expanding the realism problems here its a little bit more down stream. Glad you mentioned the fact that there were GSE tests also required in here and that we had essentially gotten thru with most of these and so far as we needed problems concerned. Here we will begin a little bit to the lightest configuration and the variety of Sentry configurations coming thru, I would assume that there would be additional GSE testing required that will have an impact also on the Santa Cruz ability to handle this sort of schedule. Is this a true statement?

Yes that is absolutely correct.

We are in the process right now of preparing the master plan for Santa Cruz which is now on this program but also the Polaris. The Polaris activities we are only interested in the X-Able. Mr D. and I and Mr H. and I have had a number of discussions on this from my own point of view which happens to be the systems test. And we have, I think we are at some sort of approach on this area although there is nothing very much forming on paper. As far as the GSE area tests are concerned, ~~it~~ this is of interest to me also not because of the standpoint of the development of the GSE equipment, but this is a real Jim dandy place with all the GSE and blockhouse type gear laid out at one spot. We made a systems type test in which these things were married to the bird or something that looks to this equipment like a bird. I think the advantages of this kind of test is pretty obvious and my desire is that we should have had it sooner. Now this is one of the things that is in the overall plan master plan at Santa Cruz in the GSE area also the additional stands as required certainly one and perhaps two

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are also being investigated as to what their requirements should be, should they be lack of things they are now, should they be primarily for development type work or should/they be multiple purpose things or should they be taken specifically for that now this is apparently under review. This is O'Green The reoccurence of this/captive test vehicle is that type of stand permanently ? Captive test vehicle O'Green has actually come into our schedule and out of the schedule a couple of times you know during contract negotiations and as such time as it does get up there this once/again involves both B.N and myself or RK and myself, it doesn't necessarily tie stand up full count but certainly when you put a vehicle in/the stand check the particular components that you are interested in. You can interrupt this test and pull it out and then just pick it up where you were. You have to have a certain continuity of the test in order to accomplish the things you want to do. That wont be a good deal of instrumentation on it but a goodly number of parts of the system we want to look at. I think one of the considerations here we are planning for in the SENTRY vehicle one of the considerations/here has to be a round of experience that we have gained on our system in flight. And the captive test vehicle originally was planned to proceed any large number of flight vehicles with the advent of the THOR program sort of has a little different position in/the program from my point of view, but I still think for the liability purpose we might think back. As far as I understand we ~~don'~~t have a ------- captive test vehicle in the contract . ~~We~~ if see fit to contract for I should think we should be consistent with the program ~~as~~ ~~in~~ and provide for testing with it . That is correct. We always have. This is Major Zelenka: Both you Fred and Bob have indicated that have been discussions during polar not recognizing some of the problems after the complex of the PTVA type program at Santa Cruz and/also additional GSE testing with/due configurations _______. Is it within your plans here to submit some type of study report on th[redacted]re?

[redacted]

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[redacted] [redacted]

That is partial ---

In connection with your inquiry we did submit the requirement for additional stand and I think the GSE test facility. I dont remember exactly how much detail we will do and how we will make the change over , reorientation doesn't look good in its entirety but anybody here who would like to get that out and look at it . O'Green We discussed this problem with Don Murphy and Jack Carter who were here and the plan was to get this thing rolled out in real detail in addition to the proposal that was put into it so that it would all be rolled out against the schedule situation/so that it could be properly presented. When it first came up was long before the reorientation/which was prior to that by a month or two and we must admit at that time / it was recognized that the problem had tobe taken care of by other means. This was the way we - ---------. Zelenka: Now are there any other questions in this area? I wonder if we could jump the program here and go ? the launch base problems I think its a logical sequence to end police/out of Santa Cruz. It sort of looks like we shorten the time period between release from Santa Cruz and delivery down at VAFB the flight in something/in the order of about six weeks. We begin to study on the test base problems is just about a----/ Ralph King: I am-not particularly prepared regarding this discussion / which I did not know about until------ but we have had extensive discussions with regard to the standing priority at VAFB and I have/not formed a definite opinion on/the requirements down there as far at that goes. I think that we must plan on a stand of six weeks at VAFB for all flight vehicles. and that can't be shortened or lenghtened . Now with regard to the interval between flights on any one pass it should be between four and five weeks. Now here is a little bit of background on this as you know we cant make the decisions either ~~any~~ decision in this regard here. Douglas is involved and ----------------
and they have/ fixed opinions in these things to. We have talked

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with recently and during the past month with Capt Roy and Col Heisler on requirements at VAFB and they have very strongly indicated for example that they feel that we should at least plan on a minimum of 21 days on the pad for both vehicles. The booster and satellite should be on the pad for 21 days prior to launch. I am not prepared at this point to justify that full thing on the basis of our vehicle but I think its a good point to figure and I would hesitate to argue the point when they insist the integration of the satellite prior to launch would require that much time. Now we had about two weeks ago a discussion at VAFB with regard to checkout of our satellite. Now my people down there based upon the checking and detail of each of the subsystems at VAFB and going thru systems fronts and putting them in the hanger before going to the pad and then going thru a series of checks on the pad of their required because of interface check because of range safety and because of flight test work group [illegible] requirement and they came up with a schedule something like eight weeks. Based upon a five day work week that is not working Saturday and Sunday and I arbitrarily cut that to six as a plain figure, on the basis that I did not think that they would need quite as many days for checking out the guidance system and the propulsion system as they had indicated and also on the basis that it would be to our advantage to plan some overtime and some week end work for selected items that could be done perhaps with a few number of people. So I feel that a six week stand at the Base cannot be reduced at this time [illegible] forsee [illegible] in the future. Now if [illegible] possible eventually we well get the production type vehicles and the one who beats the other [illegible] could be reduced. But we are going to be required [illegible] and we are going to get into Subsystem "L" package for example, package and they will have their difficulties and we will have to work with BAD people and some of them checking out the capsule ------------------------------------. So I would not settle for less than six weeks on debates. Now regarding the interval

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between flights this is something that we can't positively estimate at this time because its going to depend to a certain extent on the amount of damage we have had in the pass. We have tried to get ~~an~~ clue on this from the demonstration flight that occurred there in December and we made some instructions of it which indicated there was a minimum of damage and it did not take too long to repair it, actually it takes quite a bit of time and just a matter of interest. One time I was down there talking to Gen Wade some time after the firing must have been three or four weeks he made a passing comment on the report that there there was a minimum of damage and they have not got the good thing working yet. So I don't think the part and purpose is that we could cut this interval down certainly not below four weeks and possibly preferably not below five weeks. Here again we just don't know until we have a flight and determine how many -----------

Major Zelenka: Is there that much difference between the pad at Vandenberg and those at Patrick that you couldn't take the experience factor from the Patrick firing ? Of course we don't have the same we don't have the inviolable arrangements that we have at Patrick that we have here I am not too familar with the part that Patrick . The Patrick facilities as you know involve the gantry which is an access to a lot of things which is going to have be built permenantly and that also is a rare-stand so that there is adequate water break protection for things that are likely to get hot. The VAFB installations that we are using are essentially the great operational configurations in which no particular protection is given to these things other than wearing the shield to protect from blast wrapping things with aluminum foil and so forth with very little water on the pad and the installation is on umbilical mast

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everything else is such that its suseptable to a lot more damage and is not as easily repaired.

WE have also between this first flight and the next one some modificatinns to make _______. I'm sure that the vehicles will vary enough so that there will be modifications of pad wiring, instrumentation in each ________ will change somewhat, the payloads will change and of course this involves rewiring - J-boxes, consoles and blockhouses.

I would think really on the basis that we can't afford to continue _______________ ________________ that it would be real smart to schedule say 5 weeks between 1022 and 10 ____. We have been talking all along with M_____ organization~~s~~ _______________ when we're still expecting to fly 1019 sometime back in December, we came to conclusion that we would say that a minimum time of 4 weeks would be required between 1019 and 1022. When the official schedule actually came out Col Evans said 5 weeks.

This is Maj Zelenka: You mentioned that you had arbitrarily set 6 weeks as _________ figure on the interval here- and 21 days actually on the pad - this gives you approximately 3 weeks of activities - preparing the bird.

I quoted Col Heisler and Capt _______ saying that the ______ should be on the pad for 21 days. I didn't quote that as my opinion actually, I havent really since I got that quote gone back and studies everything in detail whether that should be 18 days or ______________. I've forgotten actually what the schedule ___________ for example what the period on the pad - I think it was about 21 days.

This is Maj Plummer: How does 3 weeks sound? Is that sufficient time?

I'd say that the thing would vary in 6 weeks if we established our schedul~~exxxx~~. 3 weeks in the assembly building and 3 weeks on the pad - perhaps to 4 weeks in the assembly bldg. and 2 weeks in the pad. I think that perhaps we could shorten the span from the time on the pad to something less than 21 days although I wouldn't want to say that right at this moment.

This is Majx~~Plummer~~ Farnum: It is my understanding, as I recall, the original schedule required 8 weeks at the launch base. Now you reduced this to 6 weeks. What experience do you base this on _____________?

[redacted]

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[redacted] [redacted]

The original schedule/of 8 weeks, is based I think we first talked about it something like a year ago. Of course we didn't have ~~xxx~~ any experience - I think as far as our schedule is concerned I've been talking about 6 weeks for some time really. And its based upon experience that we had down there - just how long it does take to go through the checks and how long it takes to see that everything works, and so on.

Maj Farnum: Could we put this on the board and ______the dates in - the dates that you completed the runs in the _____bldg.

I dont have _________ I say thatactually get that from the base.

Little of background here. Negley. _______as you know took close to 6 weeks on the pad. So the learning period is pretty good here.

The 6 weeks on the pad were not recorded by us. These continuous delays from about November until we had our launch. I'm not saying that we didn't make use of it , or we ~~Wxx~~ didn't do things that we could . But the continuous flippant attitude of Douglas difficulties - in our launch and our checkout ________. The experience in 1019 that we had would be extremely difficult to transpose it to another vehicle in which we didn't have that type of delay.

Maj Zelenka: We're only ~~xxxxxxxxx~~ considering Lockheed's position here and their plans for the schedule as it exists. The other end of the problem is the booster contractor.

This is Silberman: Do you have more than one pad that can be made ready. In other words, you may have a bird sitting on 1 pad and another one getting ready for a second flight.

We'll we won't have until May. The time schedule is pad 5 - the installation is being accomplished now. In May we will have 2 pads presumably.

Silberman: In other words, before May any schedule that calls for rate of 1 firing less than 6 weeks is unrealistic.

No. I say not less than 6 weeks. We have to have the missile up at Vandenberg for 6 weeks. I've said that/interval between launches should be between 4 or 5 weeks and I would suggest 5 weeks / maybe more certain of meeting it and we don't know/ really yet how much damage yet we're going to get on the pad.

Weaver: If it take [redacted] up the pad for the next flight

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if we have to addto that 5 weeks - 3 weeks on the pad - we have 8 weeks per pad. We get one firing roughly every 2 months.

No that isn't correct. In the first place, all of the work on the pad does not have to be completed by the time we put the birds on the pad. We can - lets take 5 weeks between firings./ If we're lucky and don't get too much pad damage, It can be completed in 2 weeks. Then we immediately move the birds there and we fire them in 3 more weeks - that 5 weeks. It's entirely possible that it takes us 3 weeks to repair the pad - we could have the birds there during the work that's being accomplished during the last week because we could perhapd to some mating checks, we could perhaps checkout propulsion systems at the same time that we're completing rewiring guidance console and doing some work on the J-box.

Our best estimate would be 1 firing for every 5 weeks per pad.

I'd say the interval between the first one we should have 5 weeks. Want to take a chance - want to work a little overtime and so on - I think there is good chance that we could have the 2nd firing in 4 weeks after the first.

The maximum optimistic view is 1 firing per pad per month.

Right. I think that should be our plan based for the entire program.

You mean that if we had a minimum amount of damage and everything else worked as we hoped with 1 pad our schedule is 1 flight per monthma maximum if all goes well.

Maj Zelenka: With pad 5 first coming into existence for May firing, and knowing our previous experience on getting 4 ready - our difficulties we have had there, would you think that this 4 week interval between the first 2 shots 5 is ________.

I should think so. Pads are going to be essentially identical. I don't see any reason why if we can plan on a minimum of 4 weeks between flights on pad 4 that we can't on pad 5. I imagine an extra week to make it 5 weeks between the first and second flight because of certain unknowns and the undesirability really to cut it too close when so many people are involved. I think Maj Bumm will bear me out on that one.

Maj Allred: We talk about 5 weeks between launches yet on our schedule we show between 3 and 4 weeks, down through May. How [redacted]ng to take care of this?

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I don't know.

This is Maj Plummer: As a follow-up to this I'd like to talk specifically about the difference between the 1022 and1018 of which less than 4 weeks is scheduled and with 1018 being the first UDMH vehicle this represents the maximum modification to Pad time excluding damage and other modifications because of plumbing changes and things, this has been estimated if I'm not mistaken ________ man hours. ________________ systems check prior to the dress rehearsal and is accumulative time - it appears to me without any pad rehabilitation from damage but merely GSE plumbing pad hardware plumbing, modification etc, is in the neighborhodd of 22 days. An yet as the total time between launches it figures out about 25 days there which appears to me about 3 to 4 weeks even on the most optimum schedule.

I don't know what the situation

SIDE 3

(Maj Zelenka?)
Just one thing, when you do speak

Santa Cruz Test Base:

Bob Nagely would you like to start out and review where we are at the present time?

The schedule for 1018 is as follows. We hope To fire 1018 tomorrow. It's possible that this will slip to Saturday. We had a ________ countdown in the engine which had to be removed repair and which is now being replaced. We could expect to ship out the middle of next week. As far as the schedule for mating birds do not yet have a firmed schedule assigned for these because we sort of have to tie all of our planning to what comes out of ________ area. We do not of course know when we're going to 1020 for sure but our basic schedule, which you're probably more interested in as far as the ______ is just about as Pritchard mentioned yesterday we are willing to concede the 3 week schedule for Santa Cruz operations with certain ground rules considerations. As you know we felt and still feel that 4 weeks is a real good span. This gives us a Sufficient time we feel to do the things we like that we have to do a unreasonable and not necessarily hurry-up basis. The 3 weeks is possible if certain other things are understood. The first of these that likely both spans will be involved in ____________ firings. This

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means that there will not be a diversion area effort going on in the backgound as far as requirements in the blockhouse _______________. We also feel that we will have to schedule xx 2 shifts operation as a matter of course - 6 day operation as a matter of course and perhaps something in excess of 8 hours. This I don't know. I hate right now to say we will need for example 2 10 hour shifts but it is quite likely that we will. We will probably need some additional equipment and support in the instrumentation area assuming that we still have to make the same type of tests that we're talking about right now. The scope of the tests can be reduced to eliminate substantial instrumentation requirements for example if the axxeptance team feels that they will accept the bird based on less parameters as far as __________ is concerned, then we can probably make due with what we have. Maybe only minor ________ extensions therefrom. If we have to go pretty much the way we've been going now the set up for data processing and our technique for data evaluation will not be adequate. We probably cant get information to the acceptance team xxxxxxxxxx __________ in time to meet this ____ schedule.

Silberman: When you speak of going on multi-shift basis and speak of needing more equipment and that the present equipment on hand won't be adequate what do you mean by inadequate. Inadequate to meet the schedule that Mr. Richter has layed out for getting the birds to Santa Cruz or do you mean an accelerated schedule.

I mean an any schedule which gives us less than xx 4 weeks span at Santa Cruz.

But you do have enough for 4 weeks.

Oh yes, I'm not anything new in the way of facilities here or any major things in the way of equipment. The thing I have in mind forexample is in the instrumentation and data reduction area. I think you recall how the 1019 and 1922 firing, we did a lot of scrounging of paper __________ in the ordnance area were using xxxxxxxxxxxx __________ for some of our instrumentation work, we had a CDC _______________ sitting on the test stand because we couldn't get sufficient instrumentation into the blockhouse, this sort of things, minor items but the sort of things that break your back when you're trying to get something out tomorrow. W

Silberman: The shortage would develop if [redacted] were accelerated.

[redacted] [redacted]

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[redacted] [redacted]

Thats right. If we tried to do anything on less than a ~~3~~ 4 week schedule [redacted] its pretty well indicated that we have to do something formal in the way of ________.

Weaver: This 3 week span, do you mean by that 3 week span per vehicle or every 3 weeks you can put out a vehicle. In other words can you work 2 vehicles simultaneously.

Oh yes, We have 2 test stands that are capable of accepting flight vehicles. We feel that assuming that May 1 is the date of their arrival at Santa Cruz that we be able to fire the engine assuming we conducting the same sort of test that we arenow performing, we ~~xxxxxxxxxxxx~~should be able to make our hot firing in about 2 weeks - say on the 14th day, or the 15th or 16th. And then allow a couple of days for cleaning up afterwards ~~thxx~~ and the necessary review by Lockheed ________BMD people. ___________Ship out the 20th or 21st day. This means the bird is at the facility for 2 weeks but there is another bird in an overlap ~~pxxxxxxx~~ schedule.

Swanson: Will the weather interfere with the schedule?

Hopefully not now since the ________has been installed on the test stand.

Joe ?__________

Maj Zelenka: I wonder if we couldn't put Richter's schedule back on the board. We have a point of departure here.

I think one of things that you should appreciate is that Bob is presenting for you a flight test program and taking into account nothing on the Development Program and firing the engines for that purpose is concerned.

This is Farnum: It is my understanding that ~~xx~~ to work on 2 vehicle up there ~~xx~~ simultaneously you need a change in ________--Is this change been accomplished. When is the effectivity of this change.

The change that we were talking about up there was one which in the blockhouse allows us to do a quicker patch job between vehicles. This ~~x~~ did actually startprocessing - Bob do you know ~~that~~ date of that.

Joe would you like to comment on that. [redacted]

___________, Santa ~~Crux~~ Cruz: Essent[redacted]se is set up now is not the manner in which we planned it.

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Because of the rush of getting vehicles in and out of the stand at the beginning of the program much of our instrumentation effort was deferred. We ________________ I understand was just approved by BMD that will enable us to fire birds from each stand practically 48 to 72 hours apart. Right now our major problem is that we have to have a systems run on a bird in 1 stand and we have to wait a certain amount of time, 16 hours to 20 hours for the validation of this data by the BMD team and Lockheed team. Then we start our countdown. This ties the instrumentation up on that one particular stand something like 4 days. Now this does not mean that we can not be working 2 birds at one time. It means the blockhouse cannot be used for the 2nd bird during that 4 day period. But immediately after that we can switch back to the second bird and continue on with it. Essentially what we're saying is that we can run both stands at the same time now. It is extremely difficult to get firings at each stand off within 5 days. We're hoping with the AT____ we can do this , firing test stand 1 and firing test stand 2 within 2 days We will be able to do that with our new instrumentation set up. It is not in yet. The ATT___hasn't approved.

____?: How long after this approval will it take to get this _______? I'm not sure of the exact time but I think something like 5 months. With our present schedule though, we can handle with the ground rules that Bob has set up we can handle a bird 3 weeks apart but we feel we can handle 2 birds a month. In other words, firing every 2 weeks.

Maj Farnum: I understand this schedule is predicated on ________flight________ testing up there. What is programmed in the way of ________or other tests during this time period?

O'Green: This particular question is one with which we've been working with/your organ. ________down there and ________Col Battle . We do have some PTVA testing which is going on now but this particular testing is probably not going to be extended very far the reason being that we conducted our ______program for one thing and the part of the testing which you recommended to be done here was not worked out appropriately at the time of the negotiations and so there isn[redacted] coverage for us to continue that testing to the extent we feel we should. [redacted]

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[redacted] [redacted]

We are going to prepare a technical recommendation to the AF as to what the status of that is and it will be forwarded to your office Bob and on to BMD. Now one of the other things that comes up is that in a double burning has arisen and testing that will be required for that/ comes into the picture also. We have made some amount of advanced planning as to what kind of facilities requirements would be in order that we would be able to accomplish this. We presently feel that we are going to be able to take care of our PTVA testin g as it stands now development testing plus the flight testing at the same time. ,There is another question that comes right into this and that is that its impossible for any one to determine right now exactly what flight testing is required or what testing is required in all flight test vehicles. I believe that after we have tested some number of these and they have properly responded to the kind of thing you would expect at Santa Cruz then the AF and Lockheed together will want not to send all birds there. This question has been left open and we have our schedules by leaving a time span in our scheduling to allow all birds to go there whether they do or do not as it stands today. There is another thing that comes into this and that is the point that Bob Negley touched on very briefly. We originally were going to Santa Cruz inorder to get certain testing done on the engine and there are certain requirements that are layed on now which the acceptance team feels that they want to review as a result of the _____ firing up at Santa Cruz. I think there is no question about the desirability of these kind of things being involved but if we were for instance going to accept the runs that we make here on mod and checkout for these things we could minimize the amount of work that we do up there so that we can fire these things more quickly. This question is not a fully resolved one either/ That remains to be determined. These are things that fit into this whole scheduling problem at Santa Cruz which will be adjusted appropriately whether we can meet the schedules or shut down.

Maj Farnun: I think that you generally answered my question, but specificall I think the next 5 or 6 months will be the most critical time in the scheduling. Do you anticipated that you will recommendthat you don't send every vehicle through during that period?

[redacted] [redacted]

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[redacted]

I would. (O'Green) I would quote a personal opinion now. After we had fired successfully __3__ UDMN vehicles up there I then said I would be willing to skip one. And this assumes that you had appropriate performance of these same prupulsion systems in flight. If you have a problem in your propulsion system , flight or at Santa Cruz or any place in check out that would show up in any of your/Bell engine tests or any of your development tests why then you obviously aren't going to skip any part of this test program. But assuming that it was alright after 3 then you would skip 1 ~~and~~ then the next 1 and skip one, then maybe we'd skip 2 and then have it just on a quality control basis. So I think this isn't very far away from us when this could actually happen. ~~K~~ The first UDMH is to fire up _______ on this next test and then if ~~there~~ this is followed by 2 more succesful/ones then you can skip 1 ________.

Silberman: ~~Ifxxxx~~ You speak of omitting the Santa Cruz step on occasional runs assuming successful _____ can all the tests that are done at Santa Cruz be done at Vandenberg, the only drawback being that you don't have pad time available to do all that.

Actually the hot engine firing cannot be accomplished at Vandenberg at all. The flight testing other then firings - a lot more can be accomplished at Vandenberg then Santa Cruz. ~~Ralph King~~ I think that Vandenberg can't do the firing but it has the/capability of making systems run. Santa Cruz does not.

Ralph King:

Maj Zelenka: Do I understand/you to say that you have no plans for PTVA type testing on dual burn engines or UDMH engine at Santa Cruz. That this activity will be conducted at Bell?

No sir. We feel very strongly that our PTVA testing is to be done and also particularly dual burning must be accomplished up here in order to be done appropriately. We were forced to go back to Bell simply because we did not have the availability at that time ~~tax~~ for accomplishing all the things that need to be done between the JP4 engines and the UDMH engines and flight vehicles to meet the schedule. And so we agreed to go back to Bell and ~~which~~ we recommended to the AFas a matter of fact that we go back to Bell. We under feel that this testing should very definitely be done up here at this facility, ~~and~~ feel that the systems can be properly [redacted]

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[redacted] [redacted]

______? Assuming the schedule of 3 weeks, does this mean that both stands must be available for that particular checkout without consideration of this other testing. We can see that from the schedule on the board (Negley) there is

Ralph King: The answer is Yes.

Zelenka: I wonder if we might read this schedule off the board here so we can get it on the record.

Pritchard: The schedule on the beard reads as follows: 1018 out of SC on 2-10. 1020 out of mod and checkout on 2-13, out of SC 3-9, flight 4-15. 1023 out of mod and checkout 3-6, out of SC 3-30, flight 5-20. 1029 out of mod and checkout 3-19, out of SC 4-10, flight 5-27. 1025 our of mod and checkout 4-3, out of SC 4-27, flight 6-18. 1028 out of mod and checkout 4-17, out of SC 5-11, flight 6-25. 1051 out of mod checkout 4-30, out of SC 5-22, flight 7-16. 1050 out of mod and checkout 5-13, out SC 6-5, flight 7-24. 1052 out of mod and checkout 5-26,out of SC 6-18, flight 8-12. 1054 out of mod and checkout 6-9, out of SC 7-1, flight 8-25. 1055 out of mod and checkout 6-22, SC 7-15, flight 9-9. 1053, mod and checkout 7-6, SC 7-21, flight 9-22. 1056, m and c 7-30, SC 8-21, flight 10-9. Vehicle 1057, m and c 8-19, SC 9-11, flight 10-27.

Zelenka: I believe 1025, 1028 and 1051 out dates out of m and c are more optmistic then yesterday's presentation.

Yes, that's true.

King: I would like to know has that schedule been approved by weapon system mgt ?

[illegible]

This is ______?,_____negotiated.

King: I gather that youre allowing less than 4 weeks between flight of 1022 and 1018. We have the availability of the pad.

King: That flight there is the 25th. From the 25th of Feb to the 19th March ---- This schedule was originally prepared this was 2-19. This can vary and still be in that month.

[redacted]

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Maj Zelenka: I think we should note that in your readout before you didn't indicate flight date for 1018 which is 3-19. Now we have it on the record.

I don't ~~g~~ think we should indicate on the record flight of 1022 on the 25th of Feb or the _______ and the flight 1019 on the 19th.

Negley: One further problem on 1018 is your've shown the 6 week span between the delivery from Santa Cruz and launch but its pretty obvious we're not going to make 2-10 ot of SC so that ________ the flight date on 1018 for that reason also as well as _______ pad.

This is date is now what Joe: (this is Pritchard)

Middle of next week sometime.

Monday isn't it?

As far as I'm concerned the critical part of this is getting this done during the month. I don't think we can ever pin it down.

Maj Zelenka: I'd like to put 25 and the 19 back there only as a point of reference on this so we can get appeal for the shortening or lengthening of times available at the ~~ax~~ various excessive test activities. We are not committing we're out to the 25th or the 19th. Let's try to look at the realism of the scheduling here.

So if you keep slipping this date down to the last date of the month then your're never going to make your two flights in May. Less than 20 days.

Farnum: Would it be possible now to show the tentative scheduling of your test ~~xxx~~ vehicles at Santa Cruz?

Yes, I believe we can do that by calling S/S B, - they're not hear - I don't believe they are. Would you like to get them overhere?

Farnum: The way I understand it this schedule is predicated on no testing. At the same time you do have ~~to have~~ plans for some testing up there.

No sir, I think that, as a matter of fact,(O'Green) let me go back for a moment and talk now about this - we have the scheduling in front of us. Our planning that we have done at Santa Cruz has always involved PTVA testing , as a matter of fact we involve more PTVA testing at the time we were doing thi[redacted]e presently going to do. The

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[redacted] [redacted]

PTVA testing can be listed up here and at the time that we made these plans it was apparent that we were going to have to provide a means for accomplishing the testing in addition to what existed at Santa Cruz now. And we considered various ways ~~xxxxx~~ of accomplishing this. Included were ~~xxxx~~ what the possibility ~~of~~ ~~xxxxxxxxxx~~ using the test _____ lab by making a set up in there, naturally getting ~~xxxxx~~ testing or a part of our testing done there. And other possibilities are abviously additional stands. Another thing that has been in our way at Santa Cruz in meeting our schedules has been the testing of GSE up there, which actually ________ is occupying a stand also, and occupying it in such a way we weren't able to easily schedule flight vehicle in that stand or PTVA vehicle in that stand with the GSE testing going on. But the GSE testing took priority because that absolutely had to be ready by the time it came up to first flight. And so we postponed PTVA testing in order to accomplish that. Now this GSE testing has actually worked itself to the point where it isn't of the same priority now because that first round of GSE hadactually gone through that testing. ______There are however, other components of GSE which will come into the program also so another consideration was a possibility of providing additional GSE testing facilicit~~ys~~. This might possibly be in the form of just a wooden ____________ if all we wanted is altitude, just to do our pumping ________. Or something that would a simple structure as compared to a flight test stand. In all of thisplanning that we did we had a PTVA schedule which I could get on the board for you to see it.

Farnum: The reason I would like to see it is it is my understanding that the people who are committed to this schedule say~~ing~~ that this is predicated on the fact that they will have the stands available at all times for these flight operations. If someone else has a requirement up there that will take priority, take one of these stands away, then they are not committing themselves to the same schedule .

Negley: This is my problem. I don't have anything of course to do with the planning or scheduling of PTVA tests, but its obvious from this schedule that there are 2 birds at Santa Cruz all the time, if every -- bird [redacted] also can be seen from the

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[redacted]

schedules that we have for the work activity on the birds that the bird goes on the stand a day after it gets there and it stays there till the day before it leaves. So this means that there are 2 birds on 2 stands all the time/ at Santa Cruz. Now ~~if~~ it doesn't mean that both stands are occupied all the time because these stands overlap about a week or so - a week to 2 weeks which you can see from the delivery schedule. So between this one and the next one which comes along ________ is this long enough, can this ____________ I guess you can get some PTVA's in there. Otherwise I don't see how unless therequirement is waived to take every flight bird ________.

Farnum: Do you think its realistic to schedule PTVA on that basis that you hope that the installation time and thetime probably to the move it would be greater than this period that you allow.

O"Green: I agree that this would be very poor planning on the basis of any flight vehicle going ~~thre~~ there and getting/ 2 a month out, to consider that we could use the stand for any other purpose. .The vehicle can stand for 3 weeks, certainly we need a weeks time for maintenance and preparation

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That the Vandenberg effort contributes to the test program at all proves that the engines and working systems and those things at Santa Cruz - all it does is monitor during that part of the functions and if you had a solid propellant you wouldn't have a Santa Cruz operation ____________.

Farnum: This 1018 we discussed - - - also this is the first flight for recovery capsule. It is my understanding that there is going to have to be a kit incorporated on this capsule down at Vandenberg. What effect will this extra work have on the __________ time span? You already have to get that ______ off in a month - actually you have 32 days.

O"Green: Things that are going forward on 1018 are __________ a number of replacement items which have to go inside the nose cone and the reason that they go in there is because of a misunderstanding that existed between ourself and our subcontractor with regard to terminology and the [redacted] replaced [redacted] cone. We don't recognize that there

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[redacted] [redacted]

is any problem at Vandenberg time wise at any time, as a result ____________ I'm not at all sure that ~~will~~ they will be replaced here before they go to Vandenberg.

Allred: We assume this being the schedule which we are going to work through, what is being done to speed up and get out the information on time which is needed to actually run the __________ for instance the DTO. So far you've been late with every one of them. Documents and other bits of information that have been coming out late. If its not at Vandenberg its not available even~~t~~ if all the equipment ~~isxisx~~ is there.

We of course have a raft of letters from BMD, the last one asking us for a comment as to whether ~~as~~ 75 days is realistic and so on. ~~After~~ We'~~ll~~ prepared a reply to that. After being away for a few days I don't know the nature of the reply. I think it's going to be that 75 days is not particularly realistic and we have to cut down DTO's __________. We during the course of the past year have had to sit down/and figure out what a DTO is and what it should include. And I think we kind of _______ backward as to the amount of information we put into it. For the first 3 flights we put out a pretty comprehensive document I think you will agree with a h______ stuff in it and I think we can go to a DTO that is much more brief and include the DTO and nothing much else. And that we cut down the time ________.

Allred: I don't see how you can do that because the _____ group has been hollering for the DTO even in advance of what we have giving.

They holler like that for 1 or 2 reasons. Primarily because of the ~~flight~~ launch trajectory and the range safety _______. I don't see any reason why you can't give them that specific information at an early date.

Allred: Some of that information hasn't even been in the DTO's when you published it.

You mean range safety _________.

Allred: I think this is an item that requires some careful study on and ____________. We have (can't get it at all)

[redacted]

[redacted]

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[redacted] [redacted]

This is a real ~~xixmx~~ problem. So far on 1922 and 18 I don't see how it's going to get much better. We just can't nail down that ~~xxxxxxf~~ far in advance the configuration - if we froze everything, if we chopped off at some end date say 3 weeks in advance of the 75 days or something and just publish what is then current, we would have to revise it before it even got out of the shop and we~~xxx~~ would have to keep supplying you with revisions. A certain amount of this I'm sure you could handle but it just seems kind of silly to cut youself a course of action when you know you're going to have to do this from the very start. Rather than try to play it by ~~xx~~ear and see what you think you've got and maybe 85 %___________. Now this I realize is _______ as far as formal coordination with other agencies like the Flight Test Working Group is concerned but I think we can ___________ so far in coordinating with them se far on an informal basis _________ and through Col Mathison's office, and I would certainly say ~~xxx~~ that while our performance hasn't exactly been something that we could earn a medal ________ it really hasn't resulted in anything __________ to say that gee we should delay the flight.

Are you aware that the BMD regulation calls for publication of the DTO 90 days in advance (Allred) of _______

Yes I am aware of this. We can sure write you one. _______________

We decided that 60 days (Allred) would be adequate for our purposes.

I think your motives and ours are the same. We could write one 90 days - gee whizz we could write ~~xxxx~~ it 9 months but it's not going to say very much./ If it were merely rqdmt To comply with the contract why I think we can just do it and forget it. We're trying to make something useful out of it.

Allred: Well we don't/ want just a piece of papdr.

Zelenka:/ If there are'nt any ~~Ixlxxxx~~ specific questions on this schedule here, Could ~~d~~ we go on to the tracking ~~xtxtxxx~~ station ________.

Do you want any ~~xxxxx~~ detailed questions about the equipments or do you want to talk in general about the _______.

The stations noware completely installed and checkout except for one majoritem of equipment And that is the Programmi [redacted]

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[redacted] [redacted]

We had planned to go on the first flight without another major piece of equipment teletype xxxxxxxxxand records. We have since then delivered all stations and Hawaii was the last one to get it. I was actually there day before yesterday, they were checking it out. There are certain other relatively minor items that are still missing like some deliniators _______________ which I know what they are but I prefer to have Joby tell you what they are. The acquisition programmer has not been delivered to each station. It is not vital to its operation and - it's important otherwise we xxxxxxx shouldn't have programmed it but it will not influence the __________ operation on our first flight.

xx Maj Zelenka: I think the question we're trying to have answered is the state of readiness with respect to xxxxx being able to handle the flights between say now and June. I don't foresee any difficulty whatsoever.

For the record (Name: ?) The stations have been ready to support a flight from about early Dec on and the equipment which is missing will make the operation of the station a little smoother, will make the peoples problems a little simpler, but is not a requirement for the flight. The stations are ready. The xxxxxxxxxxx business of putting this schedule on the board is a problem which I can ________ only as it affects the number of people at the station. The equipment - there is no problem equipment-wise in supporting the schedule - People wise, _________________ plans for increasing the personnel- if __________________ scheduling problem, unlike the ________ problems, the workload comes in bunches, people will work for 2 or 3 passes go home and get 8 hours sleep and come back and ready for the next pass. Until there are Quite a number of simultaneous vehicles in orbit there really isn't any people problem.

Farnum: Is there any requirement at tracking stations requiring that the interval between flights will be a certain time limit. Programming say every hour.

I don't xxxxxxxxxx xxx see any particularly difficulty. I mean if the xx unfortunate - if 2 satellites went over the station at the same time.

Farnum: My point is that if you _____ a flight and you found out that some tracking is inoperable then you might need some time to repair it. In some cases you only get a week - is this realistic - schedule your launches in xx view of the problems of the tracking stat[redacted] b[redacted]llowed there. WD3 W59-214

[redacted] [redacted]

There is a considerable amount of redundancy built into the stations and we could and intend to fire even if a station is completely out of operation./ Alaskan Stations mutually support each other. I think that wouldn't be a problem except in very odd case. I could dream up a particular~~ly~~ set of equipment that could go out and give us trouble. Talked to a couple of station managers when they were down here (O'Green) for a meeting and we've gotten a ________ number of hours ______ equipment now so some of the ________________________________ ~~y~~.

I think one of the major items we have is when the~~y~~ tuner in Hawaii came up and ________ 60 foot antenna got away from us and broke ____block____. As soon as that was repaired ____________________. Within 48 hours the thing was back in operation so ________.

Farnum: What I had in mind was - Alaskan stations are essentially alike so that if you had a design problem - __________ operate the way you desire to then this would be ____________________________. The fact that you have them scheduled so close together this might not give you that opportunity.

I think that the point is well taken here and that is that _______ one station at a time _________ without having tracking difficulties. ______________ design ______________ so far off that you aren't going to get tracking to accomplish its mission I think you _______ very very low. I like to have someone check them out right now __________ __________.

Maj Zelenka: Its safe to draw the conclusion that tracking network is ready to accomodate this schedule.

(Rehbein)

What was our problem in getting delivery on these items and specifically the acquisition program which we still do not have at this late date.

Jenkins: This was not the same problem as the first nogo that we went through which was a problem of internal scheduling and problem of our having been overloaded in the work. The second problem in the delay of the acquisition program is the technical one. They ran into design problems - and had to in there and get some engineering/fix ____on this____ equipment. These have been resolved and deliveries are supposed to be next week. For the first two.

Rehbine: Do we have a downstream require[redacted]t give us this same difficulty.

[redacted] [redacted]

Sorry I don't understand the question.

Do we have something coming up down the stream that might give us the same problem .

These acquisition programs of the final equipments are due in except for a couple of ____________.

For the Discoverer?

For the Discoverer Series. Nogoes _________

Maj Zelenka: As a preface to the next speaker here again the 2 Alaskan stations they're all set to ________acquisition and countdowns on number 3 coming up rather shortly.

Yes. There is one problem that is still in the process of being resolved. That is the necessity for telemetry reception - separation in flight 3 (Names) are working on it now. It appears that we are going to have to put some additional ___________in the form of an air gap to obtain information from the satelite at separation. As far as the 2 stations now in existance is concerned they have all of their equipment necessary for their function. This is the transmitting of commands, etc, resetting of telemetry, etc. all prepared to do this.

The Recovery Force is prepared - break - lunch ???

King: As far as the operational force is concerned as you know there are now 8 C119s in Hawaii that I can say are ready in so far as taking part in the operations is concerned. The 9th C-119 that will be in Hawaii when the operation occurs is now at Edwards AFB and when it will be sent to Hawaii I don't know. Do you know Bill __________

The middle of March, dppending upon what schedule date we ________.

Of course it's still planned that ________operation of the RC-121s will go from McClellan AFB in advance of the flight. In Jan we had 2 days of rehearsals and the 21st of Jan was a capsule drop and the beacon was broken on it and it was not picked up on the direction finders on the C-119 but it was picked up on radar by the RC-121. _________the 119 to it and _________________. As it came out a destroyer picked it up and it was retrieved from the water. The 23rd of Jan. we had a another dress reheasal, another rehearsal and 2 capsules were dropped [redacted] one of these the beacon was

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[redacted] [redacted]

again damaged, the other one the beacon had been re-enforced and stayed on. ~~The~~ Both capsules were recovered on the first pass of 119 which had bean vectored ~~through/the~~ to the sites ______ by the 121. I feel pretty confident that the recovery system will work after ______ ______________. The Hawaiian control center is established now and communications are in and in Jan tests they had some difficulty with communicating directly with the aircraft One of thd solutions is that they are going to put receivers in the control center which should improve the situation, permit them to receive communications ~~directly~~ directly from the aircraft to the center. They're also working on improving the cable arrangement out ~~xxx~~ there which ____________________ communications on the last operation.

Maj Allred: ~~fx~~ On the communications, are you attempting to do anything about the transmission ~~of~~ antennas ________ and what-have-you. I understand one of the big problems if getting the Control Center to ________ dommunications ________.

This is Rhoads: I have had a more recent report since you returned Mr. King. They have found one difficulty in ______________ over there, They feel has caused their receive difficulties or troubles, and ADC is taking some measurements to determine whether or not ~~xxx~~ reorientation ________ received antennas will improve the system. At ________ Yes sir.

Maj Allred: How do you feel about the communications. Do you think it's going to be adequate.

I feel sure that the communications are going to be adequate in one way or another. Transmission as I understand it is satisfactory and we were able to communicate with the planes through the Navy communications system. There was some delay, but we still were able to communicate with the aircraft. I see no reason why before the first flight, when we have our dress rehearsal we can't have the communications working. Do you agree with that _____?

I do Ralph.

Maj Allred: One more question, about the beacon antenna on the capsule. Design work?

We have ______________, GE and I haven't had a [redacted] in the last work as to how much

[redacted]

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[redacted] [redacted]

they're going into this. ________answer that for me.

On the drop capsule previously we had the antenna sticking out from the capsule from underneath the cover. On the next drop propose to put a metal cup so that the antenna will be rolled up in the manner in which __________________operational vehicle and we hope this will eliminate the breaking off of the antenna. The one that did not break we had __________________in my progress report and the destroyer and aircraft received the signal very well. GE has been told by SSL to look into the design and see it can be improved. This is about as far as I can tell you ___________. When it does break off the signal is entirely ommitted and the possibility of the aircraft and ship picking it up isn't very good. We have to rely on the radar - the RC's and the destroyers to pick up the __________________________________

One difficulty is we're not completely ________as to where the beacon breaks off. Some people feel that it breaks immediately after being dropped from the B-47__________ and if this is the case of course we don't necessarily have to duplicate this in operations.

________? strong opinion (coughing badly) very realistic as to what the situation is going to actually be. The obvious question is why don't you put a cover over it all the time (Maj Allred, I think)?

The cover that we had to secure the capsule to this _______we had to put on page 3 we broke the antennas there and we thought it was possibly something else that was the cause of it, possibly it was the ________of the antenna in the bombay after the doors were open or it may have been at the deployment or it might have been when the capsule was picked up by the retrieving _______. But we had 1 bomb that was in the bombay that we did not drop and the antenna did not break off there and we had ______________in passing that the antenna was on at the time of passing so that we can take our pick on anyone of 3 places. At the next exercise we will have the antennas under the cover.

Maj Zelenka: Is there any particular problem area with the capsule itself that might delay the flight on #3. [redacted]

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[redacted]

[redacted]

O'Green: I just asked this question of Plummer again to make sure I had the thing straight. The plan is that we do have a certain number of shortages in that capsule and we are going to bring that capsule back to the plant after we fire xx at Santa Cruz and we have a detailed schedule of what is going to happen to the capsule here and what is going to happen to it at the base after it gets there. Jim Plummer was down there this week talking to AF and Air xxxxxxx Med people and also with Ray _______ people and he xx assures me that the 4 days we xxxx going to xxx spend in the plant and the work we're going to have do do down there we can meet with assurance the time xxxxxxxx when we xx start the systems ______________________.

Maj Zelenka: ARe the ______ medical people ready __________ speciman.

What the situation is with the ______ med people I don't know.

This is part of the thing that was worked out with Mr. Plummer the other day - and the whole thing was layed in detail day by day, what they have to do and what we have to do what we have to do together and the actual date of when it's going to take place and all this.

Weaver: Is the quality of the 2nd capsule more in line with the requirements __________.

The 2nd capsule is here now and compared to the first one you just wouldn't recognize the improvement. There are still a couple of shortages in this capsule . The chute in the capsule is not the correct size and we are going to have to replace it. We have a beacon which has to be fixed because it was burned out. But these are the only 2 real shortage items. There are other things that/ we would like to make in the way of changes _________ which are desirable changes and it depends on what the ship date of our ________ mod and check out is as to how many of these changes we can incorporate. We will not hold up the shipment of the bird __________ ________. None of them are real critical changes but many of them are desirable changes that we would like to accomplish.

Maj Zelenka: I had heard that there were 2 test runs-in one case the mice fried to death and in the 2nd case they froze to death./ Apparently it was in the area of the xxxxthe heat balance in the area of the capsule itself. Has this item been taken xxx ca [redacted]

[redacted] [redacted]

Yes. The overheatin g has been fixed. There is no problem now. I didn't hear about the freezing operation. But we've gotten this one straightened out anyway.

Maj Farnum: I understand that this capsule has to go through ________ balancing test. There is a test that has to take place because you spin the capsule up you know it gets to going this way - its important that we have it balanced ____________ this piece of equipment is being delivered or had been delivered today. The same operation you go through when you balance the wheel of a car. Its a piece of equipment that was shipped from back east and ____________. Its on the way down and is either there or will be there very shortly. I would have been there last month but _______ mistake ________ airplane. We didn't but the people who supplied the airplane did. We have a program of testing at Edwards

SIDE 5

As far as I can determine no one has received any such proposal.

This has been received down here. Talked to Capt Fruge yesterday afternoon and they apparently had a conference on this. Unofficial, they go along with pads 3,4 and 5 subject to justification on 47,800 salary and ______________________________.

This did not go in in the as a formal proposal it went in in 2 increments actually I think it was 31st Dec. In accordance with the request ____________________ then we followed later with a complete work statement covering each phase of the program that went in some time ago. It left here 26th of Jan. At the time we sent the original letter in we asked/that you give us this budgetary figure then if we wanted a formal proposal we would ask for it. I don't think we asked for a formal proposal. We didn't get a copy of the work statement or the copy of the proposal - all we have is thi s first period figure. Fruge may have ______________________. Fruge has __________. I talked to him today. We never yet had a formal proposal. We never asked for one.

Maj Zelenka: Specific question bearing on the schedule: I think we can close this session. I thank all the people who participated for their frankness ________________ ____________.

[redacted]

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